(36 & A-17) Seat No. ..... No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

T.Y. B.Sc. EXAMINATION March 2017

SEM - VI Biochemistry USO6CBCH01

Title: Molecular Biology-II

Date: 27-03-2017 **Monday** **Time: 10:00 am to 1:00 pm** **Total marks : 70**

Q.1 **Select proper option from following MCQ** **10**

1) B-galactose is an example of--------- enzyme
a) Inducible b) constitutive c) co-enzyme d) apoenzyme

2) How many enzymes are required to convert lactose to glucose in E-coli lac operon
a) 2 b) 3 c) 4 d) 5

3) Enzyme required for glycolytic sequence are examples of _____
a) co-enzyme b) apoenzyme c) constitutive d) inducible

4) Which of the following mutagen producing distortion in DNA?
a) EES b) DMS c) hypoxanthine d) proflavine

5) ____ Enzyme recognizes a damaged base and cleaves between the base and deoxyribose in the DNA
a) Glycosylase b) AP Endonuclease c) ABC excinuclease d) All of these

6) _____ protein binds to a wide range of mismatched base pair.
a) mut H b) Mut S c) Mut L d) All of these

7) Presence of lac Z gene is the important feature of ___ vector.
a) Ti plasmid b) phagemid c) PBR-322 d) lambda vector

8) _____ is a vector that can replicate in the cells of more than one organism.
a) integrative plasmid b) shuttle vector c) Ti plasmid d) YAC

9) ddGTP is used in _____ method.
a) Sanger coulson b) RFLP a) Maxam & Gilbert method d) EtBr

10) _____ °c is the optimum working temperature for the enzyme isolated from thermus aquaticus.
a) 54 b) 74 c) 94 d) 98

Q.2 **Answer the following in short (any ten)** **20**

1. Explain:- leader peptide is an operon regulatory device.
2. What is function of TFIIH and TBP.
3. What do you know about transcriptionally inactive chromtatin.
4. Explain: Acridine causes insertion in DNA.
5. Write function of ABC Excinuclease.
6. Explain: Effect of X-ray as a mutagens.
7. Write function of Guanidium thiocynate.
8. What is use of cetyl trimethyl ammonium bromide.
9. Define integrative plasmid and plasmid.
10. What do you know about restriction fragment length polymorphism.
11. Justify the statement "DNA fingerprinting is more reliable compare to thumb printing.
12. Explain in short ; genomic libraries.

Q-3 Define oparon,write use of enzyme in Lac operon and explain in detail positive control mechanism of lac oparon **10**

OR

Q-3 Repressor mechanism of trp operon with flow chart. **10**

Q4. **Write Short note on**

a) Base analogus **5**

b) Nucleotide Excision repair. **5**

OR

Q4. **Write short note on:**

a) Mismatch repair **5**

b) Base Excision repair **5**

Q5. **Explain:**

a) EtBr-CSCl density gradient centrifugation **5**

b) Tumer inducing plasmid **5**

OR

Q5. a) Cosmid vector **5**

b) Lambda vector **5**

Q.6 **Explain**

(a) Northern blotting **5**

(b) Electroblotting. **5**

OR

Q.6 **Explain:**

(a) Chain termination method. **7**

(b) cDNA library. **3**

BEST OF LUCK

— X —

[16A & A-17] Seat No. _____ No. of printed pages : 2

SARDAR PATEL UNIVERSITY
B.Sc. (VI Semester) Examination
2017
Tuesday, 28th March
10.00 a.m. to 1.00 p.m.
US06CBCH02 : Plant Biochemistry

Total Marks: 70

Q.1 Multiple choice Questions: 10 marks

1. Cell wall proteins are often high in the amino acids ----------
A] proline and lysine. B] proline and hydroxyprolin. C] hydroxyproline . D] lysine

2. Gram negative bacterial cell wall contain ----------
A] O antigen B] prolinebase. C] antibody . D] all three

3. ------- galacturonic acid molecules are present in Pectic acid- polymer..
A]1100 B]1000 C]100 D] 10

4. ----------is responsible for inhibits , cell growth
A] Cytokinins B] ethylene C] auxin D] Abscisic acid

5. Many pharmaceutical preparation use----------
A] gibberlin B] ethylene C] auxin D] salicylic acid

6. Plant growth regulators are known as----------
A] enzymes B] activators C] phyto hormones D] all three

7. ---------- protect plants against damage by UV radiation.
A]Anthocyanins B]isoflavonoids c]flavanols D] all three

8. ---------- is a water-soluble flavonoid polymers ,
A]Tannins B] isoflavonoids c] flavanols D] Anthocyanins

9. Chlorophyll absorbs every color except ----------
A] green B]red C] violet D] yellow

10. Stacks of thykaloids are contained in sacs called -------.
A]granuals B]stroma C] grana D] stomata

(P.T.O.)

Q.2 Answer in short. (Two mark each-Attempt any ten) 20 marks

1 What is Guttation.
2 Enlist poly saccharides present in secondary cell wall and primary wall of plant.
3 Write on role of pectin.
4 How ethylene play a role in plant stem thickness.
5 Draw the structure for basic plant hormone.
6 Write importance of Jasmonic acid
7 Explain role of Cutin.
8 What is Anthocyanins .
9 What do you mean by phenolics.
10 Define – photosynthesis.
11 What is C_3 carbon fixation
12 Define -Hill reaction

LONG QUESTIONS 40 marks

Q.3 A] Explain -Translocation of water 6

B] Discuss- absorption of water by plants 4

OR

Q.3 A] Discuss composition of secondary cell wall 5

B] write an account on cell expansion 5

Q.4 A] Discuss role of auxin as a plant hormone 6

B] Explain-importance of salicylic acid 4

OR

Q.4 A] Discuss effect of cytokines and auxin on plant growth 5

B] Write on importance of regulatory hormone. 5

Q.5 A] which are the factors effecting photosynthesis. Explain any three in detail. 6

B] give an account on C3 plants 4

OR

Q.5 A] Discuss phases of Calvin cycle 6

B] Explain "Z" scheme 4

Q.6 A] What is phenol? Write structure and functions for any six poly phenols. 10

OR

Q.6 B] Write an account on plant protective compound. 10

— X —

(33 & A-17) SEAT No._____ No. of Printed Pages: 3

SARDAR PATEL UNIVERSITY

B.Sc. –VI Semester Examination 2017

Friday, 31st March

10.00A.m. to 1.00 P.m.

Subject Code: US06CBCH03

(Metabolism II).

Total Marks: 70

Q1. **Choose the correct option and write it in the answer sheet:** **[10]**

1. The ultimate electron acceptor yielding.
   a) Sugar b) CO2 c) Water d) GTP
2. The use of protein motive force for ATP synthesis catalysed by .....
   a) F1 ATPase b) ATP Synthase c) Cytochrome Oxidase d) none of these.
3. Uncoupling agents uncouple oxidation from.
   a) Conjugation b) Glycosylation c) Phosphorylation d) Saponification.
4. The Mitochondrion consists of .....distinct sub regions.
   a) One b) Five c) Four d) Ten
5. Nitrogen is a key component of..... .
   a) Fatty acid b) Amino acid c) Ascorbic acid d) pyruvic acid
6. The catabolism of Amino acids usually begins by removing the group
   a) Keto b) Amino c) Hydroxyl d) Carbonyl
7. Neonatal vomiting and mental retardation are symptoms of...
   a) Albinism b) PKU c) MSD d) Alkeptonuria
8. Gaunine is deaminated to form .....
   a) Glucose 6 Phosphate b) Xanthine c) Auxine d) Urea.
9. FADH2 and NADH finally oxidized in .....
   a) ETC b) TCA c) HMP d) None of these
10. Pyrimidine rings are synthesized from carbomylphophate .....
    a) Citrate b) Acetate c) Aspartate d) Bicarbonate

[PTO]

Q2. Answer the followings in short (any ten) **[20]**

1. Define Free energy, Entropy and Enthalpy.
2. What are high energy compounds?
3. Define Antioxidants? With examples.
4. What are site specific inhibitors of ETC?..
5. List out various inhibitors of protein synthesis.
6. Define uricotelic, amnotelic and ureotelic with example.
7. What is treatment for Gout?
8. Write briefly about obesity.
9. What is energy demand and supply?
10. What are locations of various Glucosetransporters?
11. Define cytochromes and Coenzyme Q.
12. Draw structures of Pyrimidine and purine.

Q-3 A) Describe in detail about ETC. **[07]**

B)Write notes on conformational coupling hypothesis **[03]**

OR

Q-3 A) Discuss harmful effects of free radicles on Biomolecules. **[05]**

B) Write notes on nutritional antioxidants. **[05]**

Q-4 Describe in detail about Krebs-Henseleit cycle. **[10]**

OR

Q-4 A) Write detail notes on Transamination. **[06]**

B) Explain oxidative deamination. **[04]**

Q-5 A) Write notes on pyrimidine biosynthesis. **[05]**

B) Discuss about regulation of purine biosynthesis. **[05]**

OR

Q-5 Explain prolonged or acute elevation of blood urate can cause Gout. **[10]**

Q6 Write detail about interrelation between Urea and Tricarboxylic acid cycle. **[10]**

OR

Q-6 A) Draw an overview of integration of metabolic pathways. **[04]**

B) Discuss about metabolic changes during hyperglycemic condition. **[06]**

SEAT No._____ No. of Printed Pages : 3

[338A16]

SARDAR PATEL UNIVERSITY

B.Sc. VI Semester Examination 2017

Monday, 3rd April

10:0 Am. To 1:00 p.m.

Subject Code: US06CBCH04

(Clinical Biochemistry)

Total Marks: 70

Q1 Choose the correct option and write it in the answer sheet: [10]

1. Which of these blood cells known as protein cell?
   a) WBC b) RBC c) Monocytes d) all of these

2. One of the following is normal component of urine.
   a) Protein b) Sugar c)Urea d) blood cell

3. The percentage of formed elements.....
   a) 55 b) 58 c) 45 d) 65

4. Haptaglobin binds and prevents the excretion of .....
   a) Free Hb b) Heparin c) Albumin d) HDL

5. Harmful cholesterol is carried on?
   a) HDL b) LDL c) Hb d) Chylomicrone

6. Carbon monoxide is a toxic compound that can bind with Hb in the same manner as.
   a) Oxygen b) Carbon dioxide c) Iron d) None of these.

7. Macrocytic Anemia is caused by deficiency of
   a) Vit A b) Folic acid c) Calcium d) sugar

8. In haemolytic Jaundice, Van den Bergh reaction is
   a) Indirect positive b) Direct positive c) Bisphasis d) None of these.

9. The serum enzymes elevated in alcoholic cirrhosis of liver is
   a) GGT b) Hexokinase c) Urease d) None of these.

10. Which clotting factors do initiate the blood clotting by intrinsic pathway?
    a) XI b) XII c) VII d) II.

(PTO)

Q2. Answer the followings in short (any ten): [20]

1. Define clinical biochemistry.
2. What are the major types of diseases?
3. What are formed elements of blood? Write their normal range in blood.
4. Albumin carrying only 10% copper but though it is major supplier of copper to the tissue why?
5. Write about nitrogenous constituents of urine.
6. Write formula to calculate inulin clearance.
7. Explain urea clearance value below 60% of the normal viewed seriously.
8. Explain Haemoglobin is a conjugated respiratory protein.
9. Why Iron deficiency leads to Anemia?
10. What is microcytic – hypochromic Anemia?
11. Write names of $\alpha 1, \alpha 2$, and β globulins.
12. Write role of Thromboxane A_2 during blood coagulation.

Q3 (a) Write notes on specific gravity of Blood. **[05]**

(b) Discuss blood is involved in heat regulation of the body. **[05]**

OR

Q3 (a) What are major causes of disease? List few non-infectious disease. **[07]**

(b) Arterial blood is bright crimson; Venous blood is a darker red why? **[03]**

Q4 (a) Discuss in detail about lipoprotein which tends to be increased by jogging and running and decreased by smoking. **[07]**

(b) Explain most of substances concerned in immunological reactions are of protein in nature. **[03]**

OR

Q4 (a) Discuss in detail about Haptoglobin and Ceruloplasmin. **[07]**

(b) Write about effect of smoking on αAT. **[03]**

Q5 Write about van den Bergh reaction and various type of Icterus. **[10]**

OR

Q5 a) Describe various biochemical tests to access kidney functions. **[06]**

b) Write notes on functions of liver. **[04]**

Q6 a) Describe in detail about role of thrombocyte during blood coagulation. **[05]**

b) Write notes on chemistry and structure of haemoglobin. **[05]**

OR

Q6 a) Write notes on haemolytic Anemia **[03]**

b) Draw the extrinsic pathway and write about factors required for blood coagulation. **[07]**

-X-

SEAT No._____ No. of Printed Pages : 2

[9A]

SARDAR PATEL UNIVERSITY
V.V. Nagar-388 120
B.Sc. Biochemistry (VI- SEMESTER)

Subject: IMMUNOLOGY **US06CBCH05**

DATE: 8/4/2017 10.00 to 1.00 **TOTAL MARKS: 70**

Q.1 Multiple Choice questions : (1 Mark each) **10**

1. Which of the following is involved in secondary lymphoid organ?
   a. Thymus c. Lymph Node
   b. Bone Marrow d. All of above
2. T-cell development and maturation take place in
   a. Thymus c. Lymph Node
   b. Bone Marrow d. Bursa of Fabricius
3. The following complement molecule is not involved in alternative pathway
   a. C_3 c. C_1
   b. Factor B d. Factor D
4. Which of the following immunoglobulin is abundant in serum?
   a. Ig G c. Ig M
   b. Ig E d. Ig A
5. Which immunoglobulin can cross the placenta?
   c. Ig G c. Ig M
   a. Ig E d. Ig A
6. MHC complex in human recognise as
   a. HLA complex c. H-2 Complex
   b. HAL complex d. H-5 complex
7. The Widal test follow the following immunological reaction
   a. Precipitation reaction c. Agglutination reaction
   b. Double diffusion reaction d. ELISA
8. Graft vs. Host reaction is caused by _____.
   a. Complement c. B-Lymphocyte
   b. T-Lymphocyte d. Macrophages
9. BCG vaccine provides _____ immunity to human.
   a. Passive immunity c. Active immunity
   b. Autoimmunity d. None of Above
10. Transfusion reaction is a
    a. Type –I hypersensitivity c. Type –II hypersensitivity
    b. Type –IV hypersensitivity d. Type –III hypersensitivity

Q.2 Answer in very short (Any Ten) **20**

1. Write down the function of MHC Class – I.
2. What is primary lymphoid organ? Enlist it.
3. Explain the role of Ig G in immunity.
4. Describe passive immunity with appropriate example.
5. Differentiate agglutination and precipitation
6. Define Innate and Acquired immunity.
7. Why IgM is more efficiently neutralise viral infectivity than Ig G?

(PTO)

8. What is autograft and Isograft?
9. Give a brief note on : Hypersensitivity
10. Define autoimmune disease.
11. Write down the principal of ELISA.
12. Write down the role of various types of WBC.

Q.3 a) Explain various anatomical features involved in first line of defences mechanism. [5]

b) List various secondary lymphoid organs. Explain structure and function of any one of it. [5]

OR

Q.3 a) Describe the third line of defence mechanism in detail. [5]

b) Write a short note on : Alternative pathway [5]

Q.4 a) Define B-Cell receptor. Explain the various essential features of antigen [5]

b) Draw the structure of immunoglobulin. Discuss various parts of it. [5]

OR

Q.4 a) Write a short note on : ELISA [5]

b) Write down the mechanism of Agglutination in detail. [5]

Q.5 a) Describe various classes of Transplantation. [5]

b) Explain the mechanism of allograft rejection. [5]

OR

Q.5 Write a note on : a) Ig M [5]

b) Tumor Antigen [5]

Q.6 Describe various routes of administration of vaccine [10]

OR

Q.6 Explain the Delayed type of Hypersensitivity in detail. [10]

—X—

c 2 7

SEAT No._____ No. of Printed Pages : 2

[187A15] SARDAR PATEL UNIVERSITY

EXTERNAL EXAMINATION– APRIL/ MAY - 2017

B.Sc. - BIOCHEMISTRY. VI semester

Microbiology and fermentation technology.

Paper Code No. US06CBCH06

DATE:-7/4/17 Total marks:70 Time:10:00am -1:00pm

Q.1 Multiple choice Questions: **10 marks**

1. Prokaryotes can be kept in major ---------- division
   A)Six B)Five C) Two D) Four
2. ----------dose not contain Cell Wall
   A)Chloroplasts B)Eukaryotic C) Spheroplast D)Primitive
3. Vinegar generator with modern technology is equipped with automatic control for ----------
   A] alcoholic liquid B] starch C] fruit juice D] culture
4. Alcohol distillation without transfer is carried out by ----------method
   A] batch culture B] continuous culture C] Microbial shiphon D] All Three
5. Production of commercial enzymes is from---------
   A] Plant B] Animal C] Microbial source D] All Three
6. ---------- is example of hard cheese.
   A] chadder B] cucumberent C] Microbial source D] All Three
7. For fermentation of milk, Symbiotic Culture is composed of
   A)S.thermophilus B)*l.durbrueckli*
   C)*S.thermophilus&l.durbrueckli* D)*propiniobacterium*
8. Use of Antibiotics kill out intestine ---------- bacteria
   A) Harmful B) beneficial C) gram positive D) gram negative
9. Industrially important microorganism can be isolated using----------
   A)Selective pressure B) Selective factor
   C) Selective medium D) None of the abov
10. ---------- method of preservation requires Dewar flask.
    A] Lyophilization B] nitrogen storage C] mineral oil D]all three

Q.2 Answer in short. (Two mark each-Attempt any ten) 20

1. Write on Whitaker classification.
2. Classify phylum Firmicutes.
3. Differentiate ribosomes of plant cell and bacterial cell
4. Highlight on ranges of fermentation process.
5. What do you mean by Open System of fermentation
6. Write on application of protease enzyme in dairy industry.
7. Classify types of cheese
8. List the amount of protein present in different sources of milk.
9. Why irradiated milk is good for health.
10. Write on method to detect Antibiotics ?
11. Explain importance of the mineral oil to preserve industrially important microorganisms .
12. Define - screening of micro organisms

LONG QUESTIONS 40

Q.3 A] Draw a structure for gram positive bacterial cell wall and explain labelled biomolecule 5

B] Discuss- effect of streptomycin on cell wall biosynthesis of bacteria. 5

OR

Q.3 A] Draw a structure for gram negative bacterial cell wall and write an account on it's biomolecules 4

B]Explain synthesis of peptidoglycan layer in bacterial cell 6

Q.4 A] Give brief account on preservation of micro-organisms at reduced temperature. 6

B] Write an account on preservation of micro-organisms using nitrogen. 4

OR

Q.4 A] Write an account on microbial screening methods 6

B] Explain a method to study growth factor forming microorganism 4

Q.5 A] Give brief account on production of Vinegar 5

B]Explain steps in production of alcohol 5

OR

Q.5 A] Draw a generalized schematic representation of fermentation process. 5

B] Explain --role of microbial enzymes in dairy and cereal industry. 5

Q.6 A] Describe- method of cheese production. 10

OR

A] Discuss steps in production of yoghurt 10

(37 & A-29) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc (VIth SEM) (CBCS) EXAMINATION

Monday, 27th March -2017

US06CBIT01: Recombinant DNA Technology and Applications

TIME – 10.00 am TO 01.00 pm **Total Marks – 70**

Note: Figures to the right indicate full marks

Q-1 **Multiple Choice Questions (Each question of one mark)** **[10]**

1) For ligation process DNA ligase requires
   (a) ATP (c) Both a & b
   (b) NAD+ (d) None of above
2) Among the following which one is metalloenzyme
   (a) Reverse trancriptase (c) DNA Ligase
   (b) Polynucelotide Kinase (d) Alkaline phosphatase
3) Gene of interest can be selected from a genomic library by using
   (a) Cloning vector (c) Restriction enzymes
   (b) DNA probes (d) gene targets
4) Expression vectors differs from a cloning vector in having
   (a) An origin site (c) Suitable marker gene
   (b) Restriction site (d) Regulatory element
5) In BAC the recombinant DNA molecules are introduced into host by
   (a) Gene gun (c) Microinjection
   (b) Electroporation (d) Direct gene injection
6) Prokaryotic expression vectors contains -------- type of promoters
   (a) Inducible (c) Both a & b
   (b) Constitutive (d) None of above
7) Which organism are widely being exploited for introducing DNA into plants
   (a) *A. tumefaciens* (c) *E.coli*
   (b) *Bacillus sps* (d) Both a & b
8) ---------- region is used to insert the foreign DNA intumor inducing plasmid
   (a) F-DNA (c) unique site
   (b) T-DNA (d) M-site
9) Which of the following is a Protein Sequence Databases
   (a) Genbank (c) EMBL
   (b) PIR (d) DDBJ
10) Which of the following is not a nucleotide sequence database
   (a) IMGT database (c) Gene bank
   (b) PDB (d) None of above

Q-2 **Attempt any ten short questions (Each question of 2 marks)** [20]

- **A** Write the applications of methylases
- **B** List the enzyme of RNases and DNases
- **C** Define Klenow fragement
- **D** Give the significance of cos site in lambda phage
- **E** Define: Phagemid vector
- **F** What are Chimeric vectors and why it is constructed?
- **G** Define Shuttle vectors and give its example
- **H** Give the examples of recombinant proteins produced by yeast expression vectors
- **I** Why is eukaryote yeast system required?
- **J** Define: databases
- **K** Give the full form of NCBI,EBI,PIR
- **L** Define: accession code

Q-3

(a)	Discuss the structure and function of DNA Pol-I enzyme	[06]
(b)	Describe the properties of polynucleotide kinases	[04]
	OR	
(a)	Give an account on DNA ligase	[06]
(b)	Give the significance of exonucleases in recombinant DNA technology	[04]

Q-4

(a)	Describe the structure of Bacteriophage lambda vector	[06]
(b)	Differentiate between insertional and replacement vectors	[04]
	OR	
(a)	Write in detail the structure and function of bacterial artificial chromosome	[06]
(b)	Discuss the replacement vector with one example	[04]

Q-5

(a)	With neat labeled diagram discuss YEp and YCp yeast cloning vectors	[05]
(b)	Explain how the recombinant Ti plasmid is constructed and used for plant transformation	[05]
	OR	
(a)	Write a note on (MAC) mammalian artificial chromosome	[05]
(b)	Explain the construction of binary vector system and give its significance	[05]

Q-6

(a)	Write a detail note on Nucleotide sequence databases	[10]
	OR	
(a)	Explain in detail the Protein sequence databases	[10]

— X —

(2)

[17A & A-29] Seat No. _____ No. of printed pages : 2

SARDAR PATEL UNIVERSITY
B.Sc. (VI Semester) Examination
2017
Tuesday, 28th March
10.00 a.m. to 1.00 p.m.
US06CBIT02 : Animal Biotechnology

Total Marks: 70

Note :
(1) Figure in the right indicates marks.
(2) All questions are compulsory. Make necessary diagram wherever needed.

Q.1. Multiple Choice Question (MCQ). Select correct answer from given MCQ. [10marks]

1.a. Continuous cell lines are also called
(A) Mortal cell lines (B) Immortal cell lines
(C) Moderate cell lines (D) Definite cell lines

1.b. Which of the following cell are examples of unspecialized cell
(A) Fibroblast (B) Somatic cell
(C) Stem cell (D) Cancer cell

1.c. Serum containing media constitutes
(A) 5-20% serun (B) 20-50% serum (C) 50-70% serum (D) 70-90% serum

1.d. Production of monoclonal antibodies can be possible through
(A) Hybridoma technology (B) Antisense technology
(C) Immunotechnology (D) Protoplast fusion technology

1.e. Which of the following medium used for screening of hybridoma cell lines
(A) Fisher medium (B) EMEM (C) DMEM (D) HAT medium

1.f. Select the correct length of human genome
(A) 320 Mbp (B) 3200 Mbp (C) 320 Kbp (D) 3200Kbp

1.g. Sickle cell anaemia is examples of which type of genetic disorder
(A) Single gene (B) Multifactorial
(C) Chromosomal (D) Mitochondrial

1..h. Which of the following virus based vector are commonly used in gene therapy
(A) Retrovirus (B) SV 40
(C) Vaccinia virus (D) Lenti virus

1..i. Ca-phosphate co-precipitate methods are examples of
(A) Physical methods of gene transfer (B) Chemical methods of gene transfer
(C) Biological methods of gene transfer (D) Natural gene transfer methods

1.j. knock out animals are those whose genomes are modified by transfer of -
(A) Foreign functional gene (B) Mutant copy of gene
(C) Multiple copies of functional gene (D) All of the above

P.T.O

Q.2. Short questions (2 marks each) attempt any ten **[2x10=20marks]**

[1] What is animal cell culture?
[2] Write a brief notes on significance of animal cell culture.
[3] Enlist the various application of stem cell.
[4] What do you mean by hybridoma cell line?
[5] Differentiate between polyclonal and monoclonal antibodies.
[6] Write a brief note on therapeutic application of monoclonal antibodies.
[7] Briefly discuss the objective of human genome project.
[8] Give the reasons of genetic disorder with suitable examples.
[9] What Are the Signs and Symptoms of Muscular dystrophy?
[10] Define the term transfection.
[11] What is inducible expression system?
[12] How antisense RNA can be used for gene inhibition?

Q3.a. How transformation is responsible for evolution of continuous cell lines? Explain. [5]
Q3.b.Explain the essential steps for culture of hematopoietic stem cell from any organism. [5]

OR

Q.3.a. Differentiate between continuous and finite cell lines with examples. [5]
Q.3.b. Enlist and explain the classes and properties of stem cell. [5]

Q.4.a. How will you construct Hybridoma cell line in laboratory? Explain. [6]
Q.4.b. Write short notes on Diagnostic application of monoclonal antibodies. [4]

OR

Q.4.a How monoclonal antibodies are produced through genetic engineering? Explain. [6]
Q.4.b.Explain the methods and importance of HAT selection techniques. [4]

Q.5.a. Write notes on organization of human genome. [5]
Q.5.b.Write notes on symptoms, clinical features and molecular cause of cystic fibrosis. [5]

OR

Q.5.a. What is gene therapy ? Explain somatic cell gene therapy with any suitable examples. [5]
Q.5.b. Write notes on symptoms, clinical features and cause of sickle cell anemia. [5]

Q.6. a.Explain microinjection techniques of gene transfer in detail. [5]
Q.6.b. Enlist various techniques of functional genomics and explain any techniques in detail. [5]

OR

Q.6.a. How will you create knockout mice in laboratory? Explain. [5]
Q.6.b. How retrovirus can be used as gene transfer in mammalian cell? Explain. [5]

----------X----------

(34 & A-28) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
Class TYBSc---Sixth semester Examination, 2017
Course: US06CBIT03; Paper ---Enzymology
Date: 31st March, 2017(Friday)

Time : 10.00am -1.00pm Maximum marks:70

Q1 MCQs. Attempt all questions, each carries ONE mark [10]

i. The substrate concentration that results in 50% V_{max} defines what?
a) K_m/V_{max} b) Km c) V_{max}/K_m d) $1/K_m$

ii. The most commonly employed cross-linked polymer is the
a) Polyacrylamide gel c). Collagen
b) Celluloses d). Cation exchange resin

iii. Commonly employed water insoluble supports for the covalent attachment of enzyme include—
a) acrylamide based polymers c) polypeptides
b) dextran d) all of the above

iv. For the processing of textile(desizing) the enzyme employed is
a) Amylase c) .Protease
b) Catalase d). lipase

v. High fructose corn syrup (HFCS) is prepared by the use of
a) Cellulase c). Protease
b) Glucoamylase d). Glucose oxidase

vi.To remove the stain of blood and egg yolk, enzyme used is
a) Cellulase c). Lipase
b) Protease d). all of the above

vii The concept that all enzymes are proteins has been shattered with the discovery of following polymer component as biocatalyst.
a) Glycogen c). Glycolipid
b) Ribonucleic acid d). Deoxy ribonucleic acid

viii. LB plot is drawn between the values of
a) 1/V and 1/S c) V and S
b) S and S/V d) V and V/S

ix. The enzymes where catalysis involves transfer of electrons are named as
a) Transferase c) Oxidoreductase
b) Isomerase d) Hydrolase

x. Value of Vmax only changes with
a) Non competitive inhibitors c) Competitive inhibitors
b) Uncompetitive inhibitors d) None of the above

Q2. Short questions. Attempt any TEN questions (2 X 10). [20]

a) Define and explain the terms V_{max} and K_m.
b) Define first order and zero order reactions.
c) Define irreversible inhibitors and give their significance.
d) Draw a double reciprocal plot with uncompetitive competitive inhibitors.
e) What do you mean by steady state kinetics?.
f) Define immobilization and enlist all the applications for immobilization
g) How enzymes can be used in baking?
h) Explain the role of pectinase in food industry.
i) Draw Eadie Hofstee plot and give its equation.
j) Give the classification of enzymes with an example of each.
k) How substrate can inhibit the enzyme catalysis?
l) Enlist the importance of submerged culture in enzyme production.
m) Enlist the use of enzymes modern biotechnology.

Q3. a. Discuss the structure of active site of enzymes. Explain the theories proposed to explain its binding to substrate? [07]

b. Define activation energy and discuss its significance. [03]

OR

Q3. Describe effect of temperature and incubation time on enzyme activity. [10]

Q4. a. Derive MM equation and explain with its plot. [06]

b. Draw the plots of mixed inhibition. [04]

OR

Q4 a. Describe uncompetitive inhibition of enzymes. Derive LB equation in presence of uncompetitive inhibitor. [06]

b. Give drawbacks of MM plot. Explain its solution with any one plot. [04]

Q5. Enlist various methods of enzyme immobilization. Explain adsorption and entrapment methods in detail. [10]

OR

Q5 a. Describe the properties and types of material used for support in immobilization. [07]

b. Give the advantages and disadvantages of cross linking method of immobilization. [03]

Q6. a. Discuss in detail the applications of enzymes in textile industry? [06]

b. Explain micelle, reverse micelle and liposomes with diagram. [04]

OR

Q6 a. Explain the use of enzymes in baking industry. [05]

b. Mention the applications of enzymes in leather industry. [05]

— X —

SEAT No._____ No. of Printed Pages: 2

[34?A28] Sardar Patel University, Semester-VI B.Sc.

Monday, 3rd April 2017

Biotechnology

US06CBIT-04

(Virology)

Time: 10: 00 A.M to 01:00 P.M Marks:70

Q-1 Multiple Choice Question (Attempt all) 10

1. Which among the following is example of Enveloped spheroidal Viruses?
   a) Poliovirus c) Parvovirus
   b) Herpes simplex virus d) Φx 174
2. A common polyhedral capsid shape of virus is?
   a) Pentagon c) Icosahedron
   b) Cube d) Sphere
3. The following is a RNA virus?
   a) Tobacco mosaic virus c) Epstein Barr virus
   b) Herpes simplex virus d) Pox virus
4. The N terminal domain of the repressor is used for?
   a) Dimerization c) Activation
   b) Binding to operator d) None
5. The lysogenic state is governed by the activity of the regulatory region of the lambda phage genome; this region is termed as?
   a) Immunity repressor c) Operon repressor
   b) Immunity operon d) None
6. HIV Infection leads to depletion of which immune functioning cells?
   a) CD4+ T cells c) B cells
   b) CD8+ T cells d) Dendritic cells
7. Vaccinia viruses are the unique DNA virus as they replicate only in _____?
   a) Nucleus c) Nucleolus
   b) Cytoplasm d) Both a and b
8. TMV plant viruses moves from cell to cell through?
   a) Epidermis c) Plasmodesmata
   b) Endodermis d) None
9. In certain virus infected plants shows reduction of size of leaves, flowers, fruits,shortening of petioles and internodes are _____ type of symptoms.
   a) Stunting c) Ring spot
   b) Necrosis d) Wilt
10. Nematodes plant parasitic are found in transmitting _____ group of viruses.
   a) Nepo viruses c) Tobra viruses
   b) Netro viruses d) Both A and C

(PTO)

Q-2 Short Question (Attempt any ten) 20

1. Give limitation of LHT system.
2. Classify virus based on morphological groups?
3. Give the role of c-I,c-II and c-III
4. Discuss the role of octamer formation.
5. Give the sequence of events diagrammatically phage penetrates into host cell?
6. How viruses of AIDs are transmitted?
7. Give general feature of Adenovirus
8. What do you mean by Reovirus
9. What do you mean by fruit abnormalities?
10. Define: Abrasive with function and example
11. By which different ways we can control the viral disease to plants from infection.
12. Viruses are connecting link between animate and inanimate object. Comment.

Q-3 A Discuss nucleic acid of viruses 05

B Enlist various assay method discuss any two 05

OR

A Give a detail account on LHT system 06

B Discuss viral envelope 04

Q-4 A How the lambda phage decide whether it proceed for lytic or lysogeny cycle. 05

B Explain the growth kinetics of phage multiplication 05

OR

A Discuss lytic cycle with respect to its molecular mechanism 10

Q-5 A Discus the multiplication of HIV virus. 06

B Give an account on Prions. 04

OR

A Draw the structure of Adenovirus and explain the steps of infection 06

B Differentiate the general properties of hepatitis virus 04

Q-6 A In brief explain various external symptoms of plants. 05

B Explain in brief transmission of plant viruses by vectors 05

OR

Q-6 A Draw the structure of TMV and explain its multiplication and movement in plants. 10

All the Best

SEAT No._____

[10A]

SARDAR PATEL UNIVERSITY
Theory Examination - March 2017
B.Sc. Biotechnology VIth Semester
US06CBIT05 (Industrial Biotechnology)
8th April 2017
10:00 a.m. to 1:00 p.m.

Total marks: 70

Q.I **Multiple choice questions:** **(10)**

1 Which statements are not correct for secondary screening?
a) It evaluates true potential of microorganisms.
b) It stay whether the organism is produced actually new product
c) It does not detect gross genetic stability of the organisms.
d) None of these

2 The approach used for strain improvement is_____.
a) Recombinant DNA technology
b) Recombination
c) Mutant selection
d) All of these

3 Which technique is used for isolation of antibiotic producing microorganisms?
a) Crowded plate technique
b) Auxanography
c) Enrichment culture technique
d) use of indicator dye

4 Solvent recovery process includes_____.
a) Condensation
b) Evaporation
c) Vapour liquid separation
d) All of these

5 _____ sparger is primarily used on laboratory scale in non agitated vessels.
a) Porous
b) Nozzle
c) Orifice
d) combined sparger- agitator

6 Which type of centrifuge is used for continuous handling of fermentation broth and coarse material?
a) Solid-Bowl Scroll centrifuge
b) Multi-chamber centrifuge
c) Basket centrifuge
d) none of these

7 $(C^* - C_L)$ may be considered as.
a) Volumetric mass transfer coefficient
b) Driving force
c) Interface area between gas and liquid
d) Dissolved oxygen concentration

8 In thermistors _____ mixture is used for measurement.
a) Pure oxides
b) Ions
b) Metals
d) None

9 Branch of Biology which deals with wine is called_____.
a) Ecology
b) Enology
c) Mycology
d) None of these

10 _____is used for production of alcohol.
a) *Zymomonas mobilis*
b) *Pseudomonas spp*
c) *Serratia spp*
d) *Rhizopus spp*

Q.II **Answer the following (Attempt Any ten)** **(20)**

1. What are auxotrophic mutant?
2. Define fermentation.
3. Give the advantages of Continuous sterilization over Batch sterilization.
4. Enlist different physical and chemical methods used for cell disruption.
5. Write about Precipitation.
6. Draw the diagram of co-current and counter current flow extraction system.
7. What is the importance of impeller, sparger and baffles in fermenter?
8. Write about pH measurement in fermentation process.
9. Give the steps of Bartholomew scientist for oxygen transfer.
10. Give a schematic representation of ethanol production by fermentation.
11. What is Sparkling wine?
12. Enlist types of techniques used in preservation of food.

Q.III a) Define primary screening. Explain any two techniques used for primary screening. **(05)**

b) Discuss various raw material used as carbon sources. **(05)**

OR

(a) Explain in detail the importance of secondary and primary screening. **(05)**

(b) What are the requirements of strain improvement in fermentation? Discuss various methods. **(05)**

Q.IV (a) Define filtration. Give a note on theory of filtration. **(05)**

(b) Which Physical mechanical methods are used for cell disruption? **(05)**

OR

(a) Write a detailed note on centrifugation technique. **(05)**

(b) Give a detailed account on Solvent Extraction. **(05)**

Q.V What is KLa? Write different techniques used for KLa determination. **(10)**

OR

(a) Describe the temperature measurement in fermentation process. **(05)**

(b) Derive KLa and Ccrit as effect of aeration and agitation. **(05)**

Q.VI (a) Give an account on production of Red Wine. **(05)**

(b) Write a note on Spoilage of food. **(05)**

OR

Q.VI Explain in detail production of cheese in fermentation industry. **(10)**

—X—

SEAT No._____

No. of Printed Pages:02

[197A26]

SARDAR PATEL UNIVERSITY
T.Y.B.Sc EXAMINATION, VIth Semester
Friday, 7th April 2017, 10.00a.m to 01.00p.m
BIOTECHNOLOGY: US06CBIT06
[Metabolism]

NOTE- Figures in the right indicate full marks. **Maximum Marks-70**

Q.1. Multiple Choice Questions (10 marks- One Mark for Each MCQ)

1.Glucose can be converted to Glycerol-3-P through which of the following intermediates?

a) Glycerol
b) Dihydroxy acetone phosphate
c) Acetyl co A
d) Pyruvate

2. NADPH is synthesized by the action of which of the following enzymes?

a) Glucose-6-P dehydrogenase
b) Pyruvate dehydrogenase
c) Acetyl co A carboxylase
d) Lipoprotein lipase

3. The process of making glucose on other sources (like amino acids) is called

a) gluconeogenesis
b) glucogenesis
c) neoglucogenesis
d) glucogenetics

4. In which of the following is carnitine directly involved?

a) Activation of fatty acids
b) Transport of fatty acyl co A
c) β-Oxidation
d) ω- Oxidation

5. β- oxidation of long chain fatty acids occurs primarily in which of the following locations?

a) Cytosol
b) Peroxisomes
c) Mitochondria matrix
d) Endoplasmic reticulum

6. Precursor for synthesis of Leucine amino acid

a) Pyruvate b) Ribose 5 phosphate c) oxaloacetate d) Phosphoenol Pyruvate

7. Transamination is catalyzed by

a) Amino acid oxidase b)amino transferase c)glutamate dehydrogenase d) all the above

8. The electron transport system is located in the _____.

a) stroma b) matrix c) cytosol d) cristae

9. The electrons transferred through the electron transport system initially belonged to

a) NADH b) $FADH_2$ c)NADH and $FADH_2$ d) oxygen.

10. Enzyme that makes ATP by chemiosmosis is

a) ATP dehydrogenase b) Gyraze c) ATP synthase d) dehydrogenase

(PTO)

Q.2. Short Question (any 10 question x2 marks each) [20]

1. Discuss about the PDH complex.
2. Describe the importance of pentose phosphate pathway.
3. Describe the reaction catalyzed by transketolase.
4. Describe the function and importance of carnitine acyltransferase.
5. Describe the importance of salvage pathway.
6. Where ketogenesis takes place and what is its drawback.
7. What is the importance of amino acid metabolism?
8. Describe the reaction catalyzed during deamination.
9. Where urea cycle takes place and what is its importance?
10. What is binding change hypothesis?
11. What is difference between oxidative and photo phosphorylation?
12. Describe about the ubiquinone carrier.

Q.3.a. Describe the oxidative pentose phosphate pathway. [5]
Q.3.b. Describe the regulation of glucose metabolism with its significance. [5]

OR

Q.3.a. Describe the gluconeogenesis with its significance. [5]
Q.3.b. Describe the TCA cycle with its ATP production. [5]

Q.4.a. Describe the pathway for the de-novo biosynthesis of Guanine. [5]
Q.4.b. Describe the β-oxidation of saturated fatty acid. [5]

OR

Q.4.a. Describe the pathway for the de-novo biosynthesis of Cytosine. [5]
Q.4.b. Describe the β-oxidation of odd carbon saturated fatty acid. [5]

Q.5.a. Describe the reaction catalyzed during oxidative transamination with example. [5]
Q.5.b. Describe urea cycle with neat diagram. [5]

OR

Q.5.a. Describe the reaction catalyzed during decarboxylation with example. [5]
Q.5.b. Give an overview for the biosynthesis of amino acid. [5]

Q.6.a. Describe the Complex II with neat diagram. [5]
Q.6.b. Describe the structure of ATP Synthase. [5]

OR

Q.6.a. Describe the chemiosmotic theory for ATP production. [5]
Q.6.b. Describe the ETC with all its carrier in detail. [5]

—X—

(38) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

EXTERNAL EXAMINATION (2017)
T. Y. Bsc (BNF)-Semester -6th

Exam Date: - 27/03/2017, Monday
Total Marks: - 70
Course:-US06CBNF01
Time: 10.00am – 1.00pm
Subject: - Web Application Development Using PERL

Q.1 Multiple Choice Questions [10]

1. Scalar Data type used which Symbol.
(a) & (b) $ (c) @ (d) @_

2. Which Operator is used to Replace a Multiple character.
(a) sr (b) tr (c) s (d) st

3. Which of the Following symbol is used to indicate variable is Reference.
(a) \ (b) $ (c) % (d) @

4. R and (1) function Return a value
(a) Only 0 and 1 (b) between 0 to 1 (c) between 0 and less than 1 (d) 0 and greater than 1

5. Which data types provides very fast look up of value?
(a) Int (b) Array (c) Hash (d) Scalar

6. Hash Data type used which symbol.
(a) $ (b)@ (c) % (d) #

7. Which of the Following function is used to add an element from begin.
(a) Push (b) unshift (c) pop (d) shift

8. Which of the Following function is used to put a value in arbitery position?
(a) join (b) scalar (c)split (d)splice

9. Which of the following symbol indicate the Variable is scalar.
(a) & (b) $ (c) @ (d) %

10. Which of the following symbol Indicate the Variable is Array.
(a) & (b) $ (c) @ (d) %

Q.2 Short Questions (**Any Ten**) [20]

1. Explain "my" Keyword?
2. Write a syntax of FASTA file.
3. Explain Rand and Scalar function with example.
4. Explain splice function with example.
5. What is use of $0?
6. Calculate Reverse Complement in PERL.
7. What is HASH?
8. Write an advantage of Subroutine.
9. Explain POP function with syntax.
10. Explain if Condition with example.
11. What is the use of Scalar Variable?
12. List different data types available in PERL.

Q.3	a)	What is Binding Operator? What is the use of Substitute operator? Explain in Detail with Example.	[6]
	b)	Convert DNA to RNA:$DNA='aaaaaaaaccggttgc';	[4]
		OR	
Q.3	a)	What is Binding Operator? What is the use of TR operator? Explain in detail.	[6]
	b)	How we Concate two DNA Fragments. Explain three Methods.	[4]
Q.4	a)	How we Search motif from file? Explain in detail with example.	[6]
	b)	Explain Push and Unshift Function with syntax and Example.	[4]
		OR	
Q.4	a)	How we Determine Frequency of Nucleotide explain with example.	[6]
	b)	Explain Scalar and shift Function with syntax and Example.	[4]
Q.5	a)	Explain Pass by Value in detail with example.	[6]
	b)	Explain Command Line Argument with Examples.	[4]
		OR	
Q.5	a)	Explain Pass by Reference in detail with example	[6]
	b)	What is Subroutine? Explain syntax of subroutine with example.	[4]
Q.6		Write a Program to Generate DNA Mutation with Example.	[10]
		OR	
Q.6		How we Create a FASTA Format file? Write a Program to Read a FASTA File, and Extract the Sequence Data from that file.	[10]

All the Best

(18A) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. – VI SEMESTER (CBCS)

US06CBNF02 : Object Oriented Programming Using JAVA

Date : 28/03/2017, Tuesday Time : 10:00 AM to 1:00 PM Max Marks : 70

Q:1 Write answers of following Multiple Choice Questions : [10]

[01] Java compiler produces an intermediate code known as _____.
(A) Bit Code (B) Byte Code
(C) Machine Code (D) User Code

[02] The process of converting one date type to another is called_____.
(A) Casting (B) Translating
(C) Declaring (D) Compiling

[03] JVM stands for _____.
(A) Java Virtual Method (B) Java Virtual Machine
(C) Java Variable & Method (D) Java Versatile Machine

[04] The default access specifier in JAVA is _____.
(A) private (B) public
(C) protected (D) friendly

[05] The _____ keyword is used to define constant in JAVA.
(A) final (B) private
(C) static (D) abstract

[06] The mechanism of deriving a new class from an old one is called _____.
(A) Method Overriding (B) Method Overloading
(C) Operator Overloading (D) Inheritance

[07] "Use of undeclared variables" is the _____ type of error.
(A) Compile Time (B) Run Time
(C) Logical (D) Exception

[08] Which of the following package is used for creating and implementing applets?
(A) java.lang (B) java.util
(C) java.applet (D) java.awt

[09] The _____ is a passive control.
(A) TextField (B) Label
(C) Button (D) None of these

[10] In _____ component we can select multiple items.
(A) Option Button (B) Choice
(C) List (D) None of these

Q:2 Answer the following short questions : Attempt Any Ten [20]

[01] What is JVM?
[02] Write down the rules for variable naming.
[03] Write syntax of do...while loop.
[04] What is constructor?
[05] What is interface?
[06] Define the final variable and final methods.
[07] Explain compile time and run time error.
[08] Explain any two string methods.
[09] Define : Exception Handling.
[10] What is event delegation?
[11] Write difference between java applet program and java application program.
[12] List down methods for KeyEvent class and ItemEvent class.

Q:3 [A] Explain Features of Java. [06]

[B] What is Operator? List all operators. Explain any one operator in detail. [04]

OR

Q:3 [C] Explain Data Types available in Java. [06]

[D] Explain if statement with syntax and example. [04]

Q:4 [A] What is Inheritance? Explain types of inheritance in detail. [10]

OR

Q:4 [B] Explain Method Overloading and Method Overriding with example. [10]

Q:5 [A] What is Package? Explain Java API packages in detail. [06]

[B] Explain concept of Stream. [04]

OR

Q:5 [C] What is Exception? Explain try and catch block with an example. [06]

[D] Explain Reader Stream Classes in detail. [04]

Q:6 [A] Explain Applet life cycle in detail. [06]

[B] Explain the following : [04]
1. Label 2. Button

OR

Q:6 [C] What is JDBC? Explain JDBC components in detail. [06]

[D] Explain the following : [04]
1. TextField 2. TextArea

(35) SEAT No._____ No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY

T.Y.B. Sc. (Bioinformatics) – Sixth Semester Examination (CBCS)

Friday, 31st March 2017

10:00 A.M to 1:00 P.M

US06CBNF03: Advanced Immunology

Total Marks: 70

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 Choose the most appropriate answer from the four alternatives given: [10]

(1) **Both B-cells and T-cells of immune system are produced in**
(A) Spleen (B) Lymphoid nodes (C) Bone marrow (D) Thymus

(2) **CD 28 would interact with:**
(A) CD4 (B) B-7 (C) CD 45 (D) B-220

(3) **Which of these cytokines specifically kills tumor cells :**
(A) IFN (B) TNF (C) MICF (D) Oncogen

(4) **The C3 convertase of alternative pathway is:**
(A) C4b2a (B) C3bBb (C) C3bBb3b (D) C2b4a

(5) **The variable region of heavy chain is encoded by**
(A) V and J regions (B) V,D and J regions (C) V,D J and C regions (D) D and J regions

(6) **An act of grafting cells or tissues between two individuals of same species is called:**
(A) Isograft (B) Allograft (C) Xenograft (D) Speciograft

(7) **Cytokines playing a significant role in inflammation are :**
(A) Interleulins (B) Inflammokines (C) Chemokines (D) TNF

(8) **Which class of antibody is playing a major role in Type-I Hypersensitivity:**
(A) IgA (B) IgE (C) IgD (D) IgM

(9) **Which of the following, belongs to Primary immunodeficiency disease:**
(A) AIDS (B) SCID (C) SLE (D) RA

(10) **Systemic Lupus Erythromatosus is a:**
(A) Immunodeficiency disease (B) Sexually transmitted disease
(C) Insect-borne disease (D) Autoimmune disease

(PTO)

Q.2 **Answer any TEN from the following:**

(1) Define positive and negative selection. [20]
(2) Make a diagram of BCR
(3) Enumerate various functions of T lymphocytes.
(4) Enumerate various functions of complement proteins.
(5) Briefly explain Isograft and allograft.
(6) Define immunosuppressive drugs and mention their usage.
(7) Enumerate factors affecting antibody diversity.
(8) Write a brief note on DTH.
(9) Give a comparative account of primary and secondary immunodeficiency
(10) Define Autoimmunity and hypersensitivity.
(11) Mention three preventive measures for AIDS
(12) Define cancer and metastasis.

Q.3 (a) Give a comparative account of B and T lymphocytes. [5]

(b) Briefly Explain T cell activation with a diagram. [5]

OR

Q.3 (a) Briefly explain B cell differentiation with a diagram. [5]

(b) Explain BCR and TCR with diagram and mention its function [5]

Q.4 Give detail account on classical and alternative complement pathway with diagram. [10]

OR

Q.4 Explain light chain gene rearrangement of immunoglobulin with labelled diagram [10]

Q.5 (a) Define transplantation. Explain Graft rejection reaction. [5]

(b) Write a note on Cytokines and their types [5]

OR

Q.5 (a) Write a short note on protooncogenes. [5]

(b) Mention the functions of cytokines in detail [5]

Q.6 (a) Explain significance and applications of bioinformatics in immunology. [5]

(b) Enumerate mechanisms proposed for generation of autoimmune disorders [5]

OR

Q.6 (a) Explain any primary immunodeficiency disease with symptoms and causes [5]

(b) Write a short note on Hypersensitivity and its types. [5]

----------x----------

SEAT No._____ No. of Printed Pages : 2

[353]

Sardar Patel University
Semester examination-2017

B.Sc VIth Semester, **Subject – Genetic Engineering-II**
Course no. US06CBNF04, **Date - 03.04.17 (Monday)**
Time – 10:00 A.M To 01:00 PM (3hrs) **Marks-70**

NOTE- Figure in the right indicates marks
All questions are compulsory. Make necessary diagram wherever needed.

Q.1. Multiple Choice Question (MCQ). Select correct answer from given MCQ. (10marks)

1.a. What does the technique of Southern blotting detect?
(A) DNA (B) RNA
(C) Proteins (D) Carbohydrates

1.b Probes can be used in genetic engineering for
(A) Detection & identification of nucleic acid sequences
(B) Sequencing of DNA
(C) Amplification of DNA
(D) Degradation of DNA

1.c. RNA can transfer from Agarose gel to solid support called
(A) Dot blot (B) Slot blot (C) Northern (D) Western blotting

1.d. RFLPs stands for
(A) Restriction fragments length polymorphism (B) Rapid fragments low polymorphic DNA
(C) Rapid fitted length polymorphic DNA (D) Restriction failure link palindromic DNA

1.e. Which of the following techniques are not examples examples of molecular markers
(A) SSR (B) Minisatellite
(C) AFLP (D) Transposition

1.f. EST are -
(A) Non functional markers (B) Functional markers
(C) Mutation in genome (D) Biochemical markers

1.g. In vitro transfer of foreign DNA into target cell is called
(A) Transduction (B) Transformation
(C) Sexduction (D) Conjugation

1..h. Particle bombardment method is
(A) Chemical method of gene transfer (B) Physical method of gene transfer
(C) Biological method of gene transfer (D) All of the above

1.i. The cell which has ability to differentiate into any type of cell are called
(A) Germinal cell (B) Somatic cell
(C) Stem cell (D) Cancer cell

1.j. Which of the following techniques can be used for treatment of hereditary diseases-
(A) Chemo therapy (B) Gene therapy
(C) Radiation therapy (D) Passive immunity

P.T.O

Q.2. Short questions (2 marks each) attempt any ten **(2x10=20marks)**

[1] What do you mean by nucleic acid hybridization?
[2] Why nucleic acid probe is important in genetic engineering?
[3] Write brief notes on application of Northern blotting.
[4] Enlist various classes of molecular markers.
[5] What should be ideal properties of good molecular markers?
[6] Write short notes on application of molecular markers.
[7] What is gene transfer system?
[8] Define the term transgenics.
[9] Briefly explain the methods of Ca++ mediated gene transfer.
[10] What is site directed mutagenesis?
[11] Enlist and define classes of stem cell.
[12] What is principle of antisense gene therapy?

Q3.a Explain the process of Western blotting in detail with suitable diagram. [5]

Q3.b. What is autoradiograpy? Explain. [5]

OR

Q.3.a. How will you transfer DNA molecule from agarose gel to memebrane? Explain. [5]

Q.3.b. Describe the methods of nick translation for preparation of DNA probes. [5]

Q.4.a. What AFLPs stand for? Explain the methods of AFLPs with suitable steps. [5]

Q.4.b. Write notes on Mini and microsatellites markers. [5]

OR

Q.4.a. How will you perform DNA fingerprinting through RFLPs? Explain. [5]

Q.4.b. Write notes on RAPD markers with advantage and limitation. [5]

Q.5.a What is electroporation? Explain. [5]

Q.5.b. Give the application of transgenic plants. [5]

OR

Q.5.a. Describe the strategy for gene transfer in mammalian cell through retrovirus. [5]

Q.5.b. Writes notes on application of transgenic animals. [5]

Q.6.a. Explain the process of somatic cell gene therapy with any suitable examples. [6]

Q.6.b. Enlist the application of stem cell. [4]

OR

Q.6.a.Discuss the properties and potential of embryonic stem cell. [6]

Q.6.b. Enlist the application of site directed mutagenesis. [4]

----------x----------

SEAT No._____ No. of Printed Pages : 2

[11A]

Sardar Patel University Examination
BSc Semester VI - US06CBNF05
Bioinformatics Applications II
8th April, 2017
10:00 am to 1:00 pm

Note: **Total Marks: 70**

1. Figures to the right indicate marks.
2. Draw neat and labelled diagram, wherever necessary.

Q.1 **Multiple choice questions** [10]

1 Microarray data processing using _____
a) Generative topographic map b) Artificial intelligence
c) Artificial neural network d) Self-organizing map

2 Microarray is extension of the _____ technique.
a. Western blot b. Southern blot c. PCR d. 2D gel

3 Following is NOT a hierarchical clustering.
a. single linkage b. K-mean c. average linkage d. complete linkage

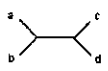
4 What is true about organisms that are a part of the same clade?
a) They all share the same basic characteristics.
b) They evolved from a shared ancestor.
c) They usually fall into the same classification taxa.
d) They have identical phylogenies

5 Following is NOT the example of rooted tree.

a. 

b. 

c. 

d. 

6 Which route of drug administration is most likely to lead to the first-pass effect?
a. Sublingual b. Oral c. Intravenous d. intramuscular

7 A compound that has a desirable properties to called as a drug.
a. lead b.find c. fit drug d. fit compound

8 In pre-clinical development, researchers often start by selecting a target associated with a disease then search for a molecule/compound that will affect the target and alter the disease. The target is usually_____
a. A gene or protein b. The lead compound
c. A healthy volunteer d. A rat or small mammal

9 Which is the most stable type of DNA under normal physiological condition?
a. A- DNA b. B-DNA c. Z-DNA d. H-DNA

10 An ORF with 300 nucleotides can code for maximum _____ number of amino acids.
a. 100 b. 150 c. 200 d. 300

Q.2 **Attempt any Ten** [20]

1 When working with an unsequenced genome, could you use a cDNA microarray, an oligonucleotide microarray, or either type of microarray? Explain?

(PTO)

2 What is clustering?

3 Differentiate complete linkage and average linkage clustering.

4 What is bootstrap value?

5 Differentiate rooted and unrooted tree.

6 What is the significance of E value?

7 What are advantages of CADD over conventional drug designing?

8 Briefly explain Lipinski's rules of five.

9 Define Combinatorial Chemistry and docking

10 How RNA is different from DNA?

11 Enlist different classes of RNAs and briefly state their functions.

12 Briefly explain of DNA double helical structure.

Q.3 Give a detailed account on image processing and clustering in microarray. [10]

OR

Discuss the steps in microarray method and steps of data analysis. [10]

Q.4 What is phylogeny ? Enlist methods used to prepare phylogeny. Construct the tree using UPGMA method with following matrix table. [10]

	A	B	C	D
A	0			
B	8	0		
C	7	9	0	
D	12	14	11	0

OR

Explain the significance of phylogeny. Discuss maximum parsimony method in detail. [10]

Q.5 A What is drug? Briefly discuss the routes of administration of drug. How choice of route may affect its designing? [05]

B Explain steps involved in CADD. [05]

OR

What is combinatorial chemistry? How application of combinatorial chemistry improves *in silico* drug designing? [10]

Q.6 What are secondary and tertiary structures of RNA? Explain M-fold method and its utility in predicting structures of RNA. [10]

OR

Write a short note on following: [10]
i) A, B and Z type of DNA ii) tRNA structure

—X—

C27

SEAT No._____ No. of Printed Pages : 2

[20]

SARDAR PATEL UNIVERSITY

T.Y.B.Sc. - BNF (SEM-VI) EXAMINATION APRIL-2017

US06CBNF06 : Structural Bioinformatics And RDBMS-II

DATE: 07/04/2017 **TIME: 10:00 TO 01:00** **TOTAL MARKS : 70**

Q.1 Multiple choice questions: [10]

1. GOR algorithm is used for prediction of structure of
   a)Protein b) DNA c) RNA d) ALL
2. The protein that help in folding protein to get functional native structure called
   a) globin b) chaperones c) myosin d) Histones
3. Which server is used to compare three-dimensional protein structures?
   a) DALI b) FSSP c) SCOP d)CATH
4. Which is the strongest bond
   a)covalent b)electrostatic c) van derwaal d)hydrogen bond
5. Homology modeling is also called as _____.
   a) comparative b) abinitio prediction c) threading d) surface
6. Functions that act on only one value at a time are called _____.
   a)Scalar b)Aggregate c)Group d)Multiple Row
7. Part of a string is retrived using _____ function.
   a) CHR b) INSTR c) SUBSTR d) INITCAP
8. The _____ clause imposes a condition of the group by clause.
   a) group by b) Having c)sub query d)where
9. _____ makes and saves the current points the processing of transaction.
   a) Commit b) save point c) roll back d) view
10. Which one of the following is not a type of join?
    a) Equijoin b) sub join c) Selfjoin d) Cross join

Q.2 Attempt any ten out of twelve. [20]

1. Why Ramachandran plot is important.
2. Give abbreviation of GOR , CATH, SCOP, PDB.
3. How ANN can be used?
4. Explain principle of protein folding.
5. When Ab initio method is used.
6. Define transmembrane and its importance.
7. Explain any 2 numerical functions.
8. Explain NVL function in brief.
9. Explain any one date functions.
10. Explain self join in brief with example.
11. Explain how to remove a sequence in brief.
12. List different privileges that can be granted to an user.

(PTO)

Q.3 Explain ANN algorithm and its utility in bioinformatics in detail [10]

OR

Q.3 Discuss any two methods for protein secondary structure prediction. [10]

Q.4(a) Explain the concept of structure comparison. [5]

(b) Explain about transmembrane. [5]

OR

Q.4(a) Explain important steps of homology modeling. [5]

(b) How PSI-PRED work? [5]

Q.5 (a) Explain SUM and COUNT function in detail with its purpose, syntax and example. [5]

(b) Explain GREATEST and LEAST function in detail. [5]

OR

Write a detail note on LIST functions. [5]

Q.5(a)

(b) Explain ADD_MONTHS function with its purpose, syntax and example. [5]

Q.6 (a) List different types of OUTER join. Explain any one in detail. [5]

(b) Explain GRANT and REVOKE command with example. [5]

OR

Q.6(a) What is the purpose of SAVEPOINT. Explain creation of save point in detail. [5]

(b) Explain CROSS JOIN with its syntax purpose and example. [5]

—X—

(C 2)

(39 & A-18) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

BOTANY-US06CBOT01 (VI SEMESTER)

(Mycology,Plant Pathology and Lichenology)

Time: 10.00a.m.-1.00p.m.

Marks-70

Date-27/03/2017, Monday

Q-1 Multiple choice questions. (10)

(1)In Ascomycetes, karyogamy occurs within the_____.
(a) ascus mother cell (b)antheridium (c)ascogonium (d)ascogenous hyphae

(2)The hormone oogonial induces_____.
(a)development of antheridium (b)development of oogonium
(c)meiosis (d)production of zygospore

(3)The protective covering of sterile hyphae around an ascocarp is known as_____.
(a)periderm (b)appendages (c)peridium (d)epiderm

(4)The infection of Ustilago tritici is caused by_____.
(a)ascospore (b)conidiospore (c)aplanospore (d)basidiospore

(5)Disease which occur all over the world and cause scale destruction of crops is related to as_____.
(a)pandemic disease (b)sporadic disease (c)both of these (d)none of these

(6)The scientist who is famous for his research on rust fungus in India is_____.
(a)A.F.Blaksleee (b)K.C.Mehta (c)Hartman (d)Korf

(7)Bunt of wheat is also known as_____.
(a)covered smut of barley (b)loose smut of wheat
(c)stinking smut of wheat (d)panama disease of banana

(8)Mycoplasma is the causal organism of_____.
(a)stem rot of jute (b)wilt of pigeon pea
(c)Tobacco Mosaic Virus (d)little leaf of brinjal

(9)Lichens are bioindicators of_____.
(a)air pollution (b)water pollution (c)land pollution (d)noise pollution

(10)In India,Lichens are common in_____.
(a)Western Himalyas (b)Eastern Himalayes (c)South India (d)Nilgiris Hills

Q-2 Answer the following(any ten). (20)

(1)How spores are disseminated in fungi?
(2)What is sclerotium in fungi?
(3)Define-Dikaryophase.
(4)Define-Necrotic symptoms.
(5)Give the main symptoms of Wart of potato.
(6)What is hypertrophy?
(7)Give the main symptoms of covered smut of barley.
(8)Name the causal organisms of----- (a) Wilt of pigeon pea (b) Club root of crucifers
(9)Write the symptoms of stem rot of jute.

(P.T.O.)

(10)Draw a labeled diagram of v.s.of lichen fruiting body.
(11)Name the kinds of lichen.
(12)Write note on- medicinal importance of lichen.

Q-3 Write about the various types of fructification in fungi. (10)

OR

Q-3Describe various types of life-cycle patterens in fungi. (10)

Q-4Give the symptoms and disease-cycle of following diseases.
(a)Downy mildew of Pea. (05)
(b)Peach leaf curl. (05)

OR

Q-4Describe the causal organism,symptoms,disease-cycle and control measures of Brown spot of rice. (10)

Q-5Explain the symptoms and control-measures of:
(a)Red rot of sugarcane. (05)
(b)Nigrospora of rice. (05)

OR

Q-5Write the symptoms and control measures of:
(a)Panama diseases of banana. (05)
(b)Little leaf of brinjal. (05)

Q-6Describe specialized structures of lichens. (10)

OR

Q-6Explain following: (a)Lichens as soil-formers. (05)
(b)External features of lichens. (05)

— X —

[19A & A-18] Seat No. _____ No. of printed pages : 2

SARDAR PATEL UNIVERSITY
B.Sc. (VI Semester) Examination
2017
Tuesday, 28th March
10.00 a.m. to 1.00 p.m.
US06CBOT02
Diversity and Systematic of Angiosperms and Ethnobotany

Total Marks: 70

Q.1. multiple choice questions. Attempt all questions. (10)

(i) Study of the evolutionary tendencies of an organism is called as?
(a) Taxonomy (b) Phylogeny (c) Both (d) None of these

(ii) Which one of the following is preferred for the re-evaluation of a taxonomic data?
(a) Neotype (b) Syntype (d) Lectotype (d) Holotype

(iii) Which one of the following name fully adhere the rules of ICBN?
(a) *Maigifera indica*(b) Victoria Rregia (c) cassia Fistula (d) All of these

(iv) The term Polypetalae has been introduced by?
(a) Bentham and Hooker (b) Engler and Prantal (c) Core (d) Hutchinson

(v) which one of the following is a primitive character?
(a) Trimerous flowers(b) Apocarpous pistil (c) Infinite stamens (d) All of these

(vi) Which one of the following group may relict as a possible ancestor of angiosperms.
(a)Psilotales (b) Gnetales (c) Filicales (d) None of these

(vii) The occurrence of different types of ecosystems, different species of plants with the whole range of their variants and genes adapted to different climates, environments along with their interactions and processes is called as?
(a) Phytodiversity (b) Biodiversity (c) Both (d) None of these

(viii) Introduction of exotic species may lead to the ?
(a) Stabilising the biodiversity (b) decrease in biodiversity
(c) Increase in the biodiversity (d) None of these

(ix) What is the definition of ethnobotany?
(a) The study of the relationship between humans and plants
(b) The relation between trees and herbs.
(c) How people utilise plants and animals
(d) All of these

(x) Who is credited to author an text in medicine and surgery in ancient India?
(a) Shushrut (b) Charak (c) Both (c) Prashar

Q.2.Short answer questions. Attempt any ten. (20)

(i) Define Ethnobotany.

(ii) What is ethnomedicine?
(iii) What are the expected qualities of a ethnobotanists?
(iv) Define genetic diversity.
(v) Enlist any three endangered species of plants.
(vi) Mention the important roles of botanical garden.
(vii) Define homology.
(viii) Write any three merits of Bentham and Hooker's system
(ix) State that how systematics differs from taxonomy?
(x) Write the suggestions made by ICBN to write the name of a species?
(xi) How will you prepare a herbarium of succulent plants?
(xii) Why the name of a species is underlined while writing?

Q.3 (a) What is typification. Describe citing examples. (05)
(b) Importance of herbarium . (05)

OR

Q.3. State how morphology and anatomy contribute significantly to plant systematic. (10)

Q.4 Write short notes on:
(a) Convergence (05)
(b Fusion in the process of evolution (05)

OR

Q.4 Explain the following in brief.
(a) Origin of angiosperms. (07)
(b) Analogy (03)

Q.5 State the importance of Forest cover in the development of your Nation. (10)

OR

Q.5.Describe your approach to the conservation of forest. (10)

Q.6. Describe the importance of ethnobotanical studies in India pertaining to health- care citing a few examples. (10)

OR

Q.6.What do you understand by native genetic resources? State our traditional knowledge can help us towards the conservation of our own plant genetic resources. (10)

Xxxxxxxxxxxxxxxxxxxxxxxx

(36 & A-18) **SEAT No._____** No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
B.Sc. SEMESTER VI EXAMINATION
CODE : US06 CBOT 03
BOTANY (PHARMACOGNOSY)
Friday 31st March, 2017,10.00 a m TO 1.00p m

TOTAL MARKS : 70

1 Choose the correct answer. **(10)**

(1) Which one of the following is a climber :
(a) *Azadirachta indica* (c) *Tylophora sp.*
(b) *Aegle marmelos* (d) *none of these*

(2) Who coined the word 'aromatherapy' :
(a) A.W. Eichler (b) Derosne (c) C.A. Seydler (d) Gantle Fosse

(3) *Commiphora wightii* is commonly known as
(a) Bael (b) Tylophora (c) Ergot (d) Guggul

(4) Botanical name of Brahmi is
(a) *Bacopa monnieri* (c) *Tylophora indica*
(b) *Aegle marmelos* (d) none of these

(5) Which drug is added to Chewing gums, Chocolate, Candy, Cigarettes, Snuff etc :
(a) *Aloe* (b) *Tylophora* (c) *Glycyrrhiza* (d) Bael

(6) Mace is:
(a) Aril of nutmeg kernel (c) Leaf of *Myristica* sp.
(b) Leaf of *Glycyrrhiza* sp. (d) none of these

(7) ``Kokum butter" is obtained from :
(a) *Garcinia purpurea* (c) *Olea europoea*
(b) *Sesamum indicum* (d) *Cinamomum camphora*

(8) Which one of the following is used for "Masticatory" ?
(a) Stramonium (b) Nux vomica (c) Ephedra (d) Coca.

(9) "Atropine" is obtained from :
(a) Belladonna (b) Nux vomica (c) Myrobalan (d) Ephedra

(10) .....is used as an ingredient of the Ayurvedic formulation "Triphala"
(a) Behra (b) Ginger (c) Turmeric (d) Cannabis

(P.T.O)

2 Attempt any ten **(20)**

(1) What was the term used in nineteenth century for pharmacognosy?
(2) What makes isapgol a good laxative?
(3) What are the chemical constituents of *Commiphora wightii?*
(4) What is the traditional use of arjuna bark?
(5) What are the uses of 'bavachi' seeds?
(6) Briefly write the chemical constituents of Brahmi.
(7) Explain the uses of eucalyptus oil.
(8) What is the source and uses of saffron?
(9) What are the chemical constituents of Linseed?
(10) Write briefly the uses of *Terminalia chebula.*
(11) What are the alkaloids present in nux-vomica.
(12) How the charas is prepared?

3. (a) How the drugs are classified based on the morphology? (06)
(b) What are the uses of bael? (04)

OR

3. (a) Write a note on drug adulteration. (05)
(b) What are the uses of honey? (05)

4. (a) Write note on uses of safed musali. (05)
(b) What are the uses of dioscorea? (05)

OR

4. (a) Write a brief note on cultivation and collection of Digitalis. (05)
(b) Write a brief note on cultivation and uses of senna. (05)

5. (a) Write a note on clove. (06)
(b) Write a note on cultivation and uses of castor. (04)

OR

5. (a) What are the uses of Cardamom. (05)
(b) Write a brief account on cultivation and uses of garlic. (05)

6. Write a note on the uses of turmeric and ginger. (10)

OR

6. Write a pharmacological note on Asafoetida. (10)

— X —

SEAT No._____ No. of Printed Pages : 2

[367A17] SARDAR PATEL UNIVERSITY

T.Y.Bsc. Examination, 2017

SEMESTER VI

ENVIRONMENTAL BIOLOGY

Subject code - US06CBOT04

Date : 03/04/2017 Day:Monday

Time: 10-00 to 1-00p.m. Total Marks: 70

Note : * All questions are to be attempted. *Figures to the right indicate marks.

Q. 1	Choose the correct answer from the given options{10x1}	10

1) ----------is used to recover & remove metals from contaminated sites.
a) Bio leaching b) Metal oxidation c) Microbial binding d) Chelation

2) Specific micro-organisms added as introduced organism to enhance the population is known as.....
a) Biofilters b) Biofilms c) Bio leaching d) Bioaugmentation

3) Multiple microbial communities grow on solid surface to produce multilayered complexes called--------
a) Biofilms b) Bioscrubbers c) Biofilters d) Biotrickling filter

4) Eutrophication is caused due to.....
a) Increase in the concentration of nutrients available b) Deficiency of oxygen
c) Oil pollution d) Radioactive isotope

5) Which is not a green house gas?
a) O_2 b) CFC c) CH_2 d) CO_2

6) Layer of ozone is present in:
a) Mesosphere b) Troposphere c) Thermosphere d) Stratosphere

7) The most dangerous metal pollutant of auto mobile exhaust is.
a) Silver b) Cadmium c) Lead d) Manganese.

8) An example of gaseous form of Acid deposition is:
a) Nitrogen oxide b)Sulphates c) Frost d)Dew

9)Environmental biotechnology involves:
a)The use of microbes to clean up the environment b) Bioremediation
c) The study of benefits and hazardsbassociated with GMMS d) All of these.

10)Environmental protection Agency is independent federal Agency of the U.S. Government established in.....
a)1970 b) 1980 c) 1960 d) 1990.

(PTO)

Q. 2	**Answer the following question (Any ten).** **1. Define: Composting.** **2. Explain: Ecology of bioremediation.** **3. Write the full form of OECD, TCE.** **4. Define: Pollution.** **5. How does the ozone layer gets depleted?** **6. What is smog?** **7. What are the sources of biological pollutants in water pollution?** **8. Which are the factors responsible for climate change?** **9. What is Environmental Biotechnology?** **10.Write the full form of UNEP and IUCN.** **11.A list of some of the important areas in which biotechnology is making marked contributions.** **12. Write the full form of CPCB,SCOPE.**	20
Q. 3	**What is bioremediation? Discuss the need, scope and the environmental applications of bioremediation.**	10
	OR	
Q. 3	**Write note on:** **a) Biodegradable plastics and biodesulphurisation.** **b) Biofilteration.** **c) Bioventing.**	 06 02 02
Q. 4	**Write note on:** **a) Air pollution control through law.** **b) Pesticides and Herbicides.**	 05 05
	OR	
Q. 4	**What are the major sources of water pollution in our country? Discuss the nature of pollutants responsible for water pollution and suggest suitable methods of its Control.**	10
Q. 5	**Describe Biotechnology and its Application in environmental protection .**	10
	OR	
Q. 5	**Write note on:** **a) Global warming.** **b) Strategies of conservation.**	 05 05
Q. 6	**Describe the Formal and Non-Formal Environmental education.**	10
	OR	
Q. 6	**Discuss the Goals, objective and guiding principles of environmental education.**	10

-X-

No. of Printed Pages : 2

SEAT No._____

[12A]

Sardar Patel University
Sixth semester examination
BOTANY, US06CBOT05
Plant Biotechnology

Time: 10.00-1.00 pm

Date: 08.04.2017
Marks: 70

Q.1. Multiple choice questions. Attempt all. 10

(i) Cybrids are produced by:
(a) fusion of two different nuclei from two different species.
(b) fusion of two same nuclei from same species.
(c) nucleus of one species but cytoplasm from both the parent species.
(d)None of these.

(ii) Part of plant used for culturing is called as:
(a) Cutting (b) Explant (c) Callus (d) Stock

(iii) Which of the following plant cells will show totipotency?
(a) Mature vessel members (b) Functional sieve -tube members
(c) Cells of apical meristem (d) Cork cells

(iv) Restriction endonuclease is used to cleavage:
(c) DNA (b) RNA (c) Both (d) Aminoacid

(v) What is used to make copies of small segments of DNA?
(a) PCR (b) Electrophoresis (c) Both (d) None of these

(vi) Gel electrophoresis is a technique used to separate:
(a) a mixture of DNA (b) a mixture of RNA
(c) a mixture of proteins (d) All of these

(vii)Which one of the following is a direct technique for the integration of DNA into the host genome?
(a) Elecroporation (b)Microinjection
(c)Particle bombardment (d) All of these

(viii)A vector used in molecular cloning is a:
(a) Ribosome (b) RNA (c) DNA (d) None of these

(ix)Biotechnology may be an promising technology for a Clean environment by the mass production of:
(a) Bio -ethanol (b) Bio -diesel
(c) Bio -butanol (d) All of these

(x) Why a plant breeder should choose genetic engineering rather than traditional breeding techniques:
(a) Traditional breeding programs are time consuming
(b) Traditional breeding always does not vouch for a desirable result.
(c) Genetic engineering allows to identify and transfer the segments of DNA coding desired traits.
(d) All of these.

Q.2.Short answer questions. Attempt any ten. 20

(i) Why we need plant tissue culture technology?
(ii) What is disinfection?
(iii) How will you digest the cell wall preceding to protoplast fusion?
(iv) Write the applications of gel electrophoresis.
(v) What is genetic engineering?
(vi) Write the importance of DNA finger printing.
(vii) What is a transgenic plant?
(viii) What are the direct methods of gene transfer?
(ix) What is plant transformation?
(x) Can biotechnology techniques may be of use in combating Pollution?
(xi) Name a transgenic variety of cotton and name the organism from which the gene in question is obtained.
(xii) Describe edible vaccines in brief.

Q.3. (a) Describe the applications of plant tissue culture. 05
(b) Describe the technologies involved in the isolation of Protoplast. 05

OR

Q.3. (a) Enlist the components of a typical culture medium Used in a plant tissue culture experiment. 04
(b) Write your approach as to how to maintain aseptic conditions in a plant tissue culture lab. 06

Q.4. Write short notes on: 5x5=10
(a) FISH (b) PCR

OR

Q.4. Write short notes on: 5x5=10
(a) DNA finger printing (b) Genomic library

Q.5. Describe the direct methods of gene transfer. 10

OR

Q.5. Show your acquaintance with Plasmids. 10

Q.6. State how biotechnology can boost our agriculture. 10

OR

Q.6.What are super bugs? Describe their application(s) in detail. 10

SEAT No._____ No. of Printed Pages : 3

[218A16]

SARDAR PATEL UNIVERSITY

B.Sc.(SEM-6)EXAMINATIONS

FRIDAY ,7TH APRIL-2017 10-00 AM TO 1-00PM

US06CBOT06-PLANT METABOLISM AND BIOCHEMISTRY(MARKS-70)

Q-1MCQ (10)

(a)E.C.-3.x.y.z is an example for the class of enzyme namely:

(i)Hydrolases(ii)Transferases(iii)Isomerases(iv)Ligases

(b)The protein part of the holo enzyme known as :

(i)coenzyme(ii)apoenzyme(iii)Holoenzyme(iv)metal activator

(c)Which factor is affecting enzyme catalyzed reaction:

(i)Temperature(ii)PH (iii)Inhibitors(iv)more than one option

(d)In Plants,glucose aerobically converted into:

(i)Lactate(ii)Pyruvate(iii)Ethanol(iv)CO2,H2O and energy

(e)Which one of the following is a triose aldose?

(a)Lactose(ii)Maltose(iii)Sucrose(iv)Glyceraldehyde

(f)Which one of the following is a non reducing sugar?

(a)Lactose(ii)Maltose(iii)Sucrose(iv)All of these

(g)Which one of the following is a PUFA?

(i)Oleic acid(ii)Arachidonicacid(iii)Acetic acid(iv)None of these

(h)How many double bond are present in Linoleic acid?

(a)1(ii)2(iii)3(iv)4

(i)Wax is a :

(a) fat (ii)Protein (iii)Hormone (iv)All of these

(j)Protein is a polymer of :

(a)Aminoacids(ii)Fattyacids (iii)Nucleotides (iv)All of these

Q-2ANSWER ANY TEN (20)

(a)Why enzymes are known as biocatalysts?

(b)Define:apoenzyme

(c)What is M-M constant?

(d)What is meant by nonreducing sugar?

(e)What is substrate level phosphorylation?

(f)What is the role of PFK in Glycolysis?

(g)What are PUFA?

(h)Write structure of oleic acid.

(i)Draw structure of alcohol present in lipids.

(j)Give example of sulphur containing aminoacids.

(k)What are the sources of nitrogen?

(l)Write steps involved in nitrogen fixation.

Q-3(a)Derive M-M equation . (07)

(b)Write in brief on induce fit model? (03)

OR

Q-3(a)Derive Line weaver Burk equation. (05)

(b)Write a note on chemical nature of enzymes. (05)

Q-4Write reactions catalyzed by following enzymes'

(i)Aldolase (ii) Pyruvate dehydrogenase(iii)Malate dehydrogenase(iv)Triose isomerise (10)

(v)Succinate dehydrogenase OR

Q-4(a)Write in detail on ETC. (07)

(b)Explain:Bridge reaction (03)

Q-5How many ATP molecules are produced after complete oxidation of one molecule of fatty acid of your choice with all reactions. (10)

OR

Q-5 Write in detail about β-Oxidation. (10)

(12)

Q-6(a)Explain:Nitrogen cycle (07)

(b)Define:Nitrification (03)

OR

Q-6(a)Write in detail about Transamination. (07)

(b)Define:Denitrification (03)

©©©©©

(40 & A-19) Seat No: _____

Total no of printed pages: 03

SARDAR PATEL UNIVERSITY

B.Sc. EXAMINATION MARCH-2017(VIth SEMESTER)

SUBJECT: ORGANIC CHEMISTRY (US06CCHE01)

DATE : 27/03/2017
DAY : MONDAY

TIME : 10:00 am to 01:00 pm
TOTAL MARKS : 70

Q. 1 : Choose the correct option for the following multiple choice questions. **10**

1) Which of the following carbohydrate is not a reducing sugar?

a) Glucose b) Sucrose c) Fructose d) Lactose

2) Which of the following reagent is used to convert D(+)-Glucose to gluconic acid ?

a) Br_2/H_2O b) conc. HNO_3 c) H_2/Ni d) HCN

3) Nitration of naphthalene gives------

a) 9-nitronaphthalene b) 10-nitronaphthalene
c) 1-nitronaphthalene d) 2-nitronaphthalene

4) Oxidation of anthracene using $K_2Cr_2O_7/H_2O$ gives-------

a) Phthalic acid b) Benzoic acid c) Benzophenone d) Anthraquinone

5) All carbon atoms in naphthalene are---------hybridized.

a)sp b) sp^2 c) sp^3 d) sp^3d

6) In Diels Alder reaction , the diene must be in --------- configuration.

a) cis b) E c) trans d) none

7) Which of the following is aromatic according to Huckel rule ?

a) cyclopropenyl cation b) Benzene c) cyclopentadienyl anion d) all

8) Which of the following is dependent chromophore?

a) $-NO_2$ b) -C=C- c)-C=O d) –OH

9) Compound appeared coloured if it absorbed light in the ---- - region.

a) UV b) Visible c) IR d) Radiofrequency

10) Which of the following is common table sugar?

a) Fructose b) Glucose c) Sucrose d) Mannose

(P.T.O.)

Q. 2 : Answer the following questions . (Any Ten) **20**

1) Explain the term epimers and reducing sugar.

2) Give the synthesis of α-methyl caproic acid from fructose.

3) Explain the effect of cyclodextrin on chemical reaction.

4) All C-C bond length in naphthalene are not identical. Explain

5) Write a note on a Bucherer reaction.

6) Draw all resonating structures of phenanthrene.

7) Write a Woodward –Hoffmann rule for electrocyclic reactions.

8) Explain the term symmetry allowed and symmetry forbidden.

9) Predict the product with appropriate stereochemistry for the following reaction.

$$\text{2 moles of cis-2-butene} \xrightarrow{\text{light}} \ ?$$

10) Write various postulates of V.B. theory.

11) What are requisites of a true dye.

12) What is a pigment? Give its applications.

Q. 3 : Answer the following questions .

a) How will confirm the confirm the structure of (+)-Glucose ? **04**

i) Presence of –CHO group. Ii) Presence of 1^0 alcoholic -OH group.

b) Show that (+)-Maltose is 4-O-(α-D-glucopyranosyl)-D-glucopyranose. **03**

c) Discuss the Ruff degradation with example. **03**

OR

Q. 3 : Answer the following questions .

a) Give the synthesis of (+)-Glucose from (-)-Arabinose. **04**

b) Discuss the oxidation of aldose. Write the silent feature of alkali effect on oxidation. **03**

c) (+)-Lactose is a galactoside and not a glucoside. **03**

Q. 4 : Answer the following questions .

a) Sulphonation play key role in chemistry of naphthalene. **03**

b) Write a short note on aromatization. **03**

c) Give the synthesis of 1-methyl naphthalene from benzene. **04**

OR

Q. 4 : Answer the following questions .

a) Outline a possible synthesis of chrysene by Bogert-Cook method. **04**

b) Write the structure and name of potent carcinogens. Discuss the mechanism of mode of action of carcinogens in human cell. **03**

c) Electrophilic substitution reactions of naphthalene takes place almost exclusively at the 1- position. **03**

Q. 5 : Answer the following questions .

a) What are pericyclic reactions? Write the characteristics of pericyclic reactions. **03**

b) Explain the Diels –Alder reaction and give the favourable condition for it. **03**

c) Electrocyclic reactions are highly stereospecific. Explain **04**

OR

Q. 5 : Answer the following questions .

a) Explain the Huckel rule. What is the theoretical basis for Huckel rule? **03**

b) [4+2] thermal cyclization takes place readily but [2+2] thermal cyclization does not. Explain **04**

c) Give the brief account on Cope rearrangement. **03**

Q. 6 : Write a note on Witts theory. Also give the synthesis and applications for **10**
i) Hansa yellow ii) Caledon Jade Green

OR

Q. 6 : What is dyeing? List the various types of forces which are involved during the dyeing process and discuss any one of them in detail. Also give the synthesis and applications for i) Tartrazine yellow ii) Crystal violet **10**

*****

(20A & A-19) Seat No: _____ No. of Printed Pages: 03

SARDAR PATEL UNIVERSITY

B. Sc. Examination (Sixth Semester)
Tuesday, 28th March-2017
10.00 am to 1.00 pm
US06CCHE02 (Organic Chemistry)

Note: (i) All questions are to be attempted. (ii) Figures to the right indicate marks. **Total Marks: 70**

Q-1 Choose the correct option and rewrite the answer. [10]

1. In nucleic acid, back bone chain is made up of _____ linkage.

   (a) polyester (b) polyamide (c) poly ether (d) none of these

2. Which one of following forms Zwitter ions.

   (a) amines (b) acids (c) amino acid (d) phenols

3. The pH at which an amino acid do not have any tendency to migrate under the influence of an electric field is known as its_____.

   (a) wave length (b) dipole moment

   (c) iodine number (d) isoelectric point

4. _____gm of uric acid present in 100 ml blood.

   (a) upto 0.4 (b) upto 0.3 (c) upto 0.2 (d) upto 0.1

5. In purine, _____ rings are fused together.

   (a) pyrimidine and pyrrole (b) pyrimidine and pyridine

   (c) pyrimidine and imidazole (d) pyrimidine and indole

6. In quinine both nitrogen atoms are _____ in nature.

   (a) 2^0 (b) 1^0 (c) 4^0 (d) 3^0

7. Which alkaloid is used as an antispasmodic agent?

   (a) Adrenaline (b) Papavarine

   (c) Nicotine (d) Quinine

8. Metahemipinic acid is a _____ acid.

   (a) mono carboxylic (b) tetra carboxylic (c) tricarboxylic (d) dicarboxylic

9. If conjugation is introduce in aldehyde or ketone, then the absorption of light occurs at _____ wave length region.

   (a) shorter (b) longer (c) both 'a' & 'b' (d) none of these.

10. During Intersystem Crossing, triplet excited state (T_1) exists for a period of time_____sec.

    (a) 10^{-5} to 10^{-3} (b) 10^{-11} (c) 10^{-9} to 10^{-6} (d) 10^{-3} to 1.

Q-2 Attempt any ten questions of following. **[20]**

1. Write the structure and name of essential heterocyclic amino acids.
2. Explain : Human beings get suffocation in CO- atmosphere.
3. Explain the term peptide .
4. Write the Murexide test of uric acid.
5. Write the Traube synthesis of Guanine.
6. Draw the chart of the nature of the products obtained by hydrolysis of nucleic acid under different condition.
7. How will you convert the veratric acid from p-hydroxy benzoic acid?
8. Write Ott's synthesis of Adrenaline.
9. How will u determine the presence of methylene group in papaverine?
10. Write synthesis of Lactone using ethylacetoacetate.
11. Give the importance of energy transfer.
12. Define the terms : **i)** Fluorescence **ii)** Phosphorescence

Q-3 Attempt the following.

[A] Write the synthesis for the following: **[06]**

(i) Lucine using direct ammonolysis.

(ii) Gly-Ala using BOC method.

(iii) Aspartic acid using Phthalimidomalonicester synthesis.

[B] Discuss P. Edman method for N-terminal residue analysis. Also give its advantages and limitation. **[04]**

OR

Q-3 Attempt the following.

[A] What is chymotrypsin? Discuss the mechanism of enzyme action of chymotrypsin. **[06]**

[B] What are proteins? Give the broad classification of proteins on the basis of their shape and discuss their properties **[04]**

Q-4 Write the hydrolysis of nucleic acid under different reaction condition and distinguish between "Nucleoside and Nucleotide". Also discuss the primary structure of RNA and secondary structure of DNA. **[10]**

OR

Q-4 Discuss the structure of Theobromine . Also give the Fischer synthesis of Theobromine and Bredereck synthesis of Xanthine, Caffeine and Theobromine from Uric acid. **[10]**

Q-5 Attempt the following.

[A] **(i)** Discuss the nature of side chain in nicotine. **[06]**

(ii) How will you establish the linkage between quininic acid and meroquinene in quinine?

[B] Discuss the extraction method for an alkaloid by using water immiscible solvents. Also give its disadvantages. **[04]**

OR

Q-5 Attempt the following.

[A] Write the synthesis for the following: **[06]**

(i) Rabe et.al. synthesis of quininic acid.

(ii) Bido and Wilkinson synthesis of papaverine.

[B] Write a short note on : Emde's degradation of alkaloid. **[04]**

Q-6 Attempt the following.

[A] Discuss photochemical cis-trans isomerization of Stilbene. Also discuss photodimerization of Norbornene. **[06]**

[B] Complete and suggest appropriate reaction mechanism involved in the following reactions. **[04]**

i) Corticosterone acetone $\xrightarrow{NOCl/Pyridine\ (25^{0}C)}$ ___ ? ___

ii) Phenyl acetate $\xrightarrow[C_2H_5OH]{h\nu}$ ___ ? ___

OR

Q-6 Attempt the following.

[A] What is Paterno-Buchi reaction? Discuss its mechanism by using ketone with symmetrical and unsymmetrical olefins. **[06]**

[B] Discuss Norrise Type-I reaction. **[04]**

ALL THE BEST

— × —

(3)

(37 & A-19) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc (Semester-VI) EXAMINATION

Subject : INORGANIC CHEMISTRY (US06CCHE03)

Date: 31/03/2017 **Time: 10 a.m to 1 p.m**

Day : Friday **Marks: 70**

Q:1 Choose the correct option from the following multiple choice questions. [10]

1 Organometallic compounds are soluble in _____ solvents.
(a) non polar (b) polar
(c) both (d) none of them

2 Most commonly used reducing agent for synthesis of organometallic compound is_____.
(a) CO_2 (b) CO
(c) MnO_2 (d) None of them

3 Which metal is responsible for structural stability of DNA & RNA ?
(a) Mg (b) Ca
(c) Zn (d) Fe

4 Cobalt in Vitamin B_{12} is found in which oxidation state ?
(a) +1 (b) +2
(c) +3 (d) +5

5 Which enzyme is responsible for the formation of melanin pigment in plants and animals ?
(a) Catalysase (b) Tyrosinase
(c) Reductase (d) isomerase

6 The reaction to be catalysed must be _____.
(a) organic (b) Kinetically favourable
(c) Homogenous (d) thermodynamically favourable

7 ZSM – 5 is _____.
(a) Aromatic compound (b) synthetic zeolite
(c) natural Zeolite (d) Ziegler – Natta catalyst

8 The process of depositing thin uniform layer of silver on a clean glass surface is called _____.
(a) printing of silver (b) Silvering of mirror
(c) fixing of silver (d) Developing of silver

9 The process of removal gangue from the ore is technically known as _____.
(a) Modification (b) Crystalization
(c) fluxing (d) Concentration

10 Galena is ore of _____?
(a) Copper (b) Silver
(c) Lead (d) nickel

(P.T.O.)

Q:2 Answer the following. (Any ten) [20]

1 Give the reaction of organometallic compounds with metal salts.
2 Give the friedel-craft alkylation reaction of Ferrocene.
3 Give three dimentional polymeric structure of organometallic compound of Mg containing one alkyl and alkoxy group.
4 What is regulatory action of metallic elements ?
5 Give the general structure of porphyrin molecule.
6 Give the main function of heamoglobin.
7 Give the four requirements of successful catalytic process.
8 Write about SO_2 oxidation.
9 Give the Benefits of Catalyst used in Fischer-tropsch synthesis.
10 Give the difference between calcination and Roasting.
11 Give the industrial applications of Lead.
12 Define: Flux and Slag.

Q:3 (a) Give the structure and bonding in metal-olefin (alkene) complexes. [05]
(b) Write note on substitution reaction method of preparing organimetallic Compounds. [05]

OR

Q:3 (a) Discuss the structure and bonding in Ferrocene. [05]
(b) Give an account on: Organometallic compounds of Mg. [05]

Q:4 (a) What are the functions of heamoglobin and myoglobin ? What are the Principal similarities and differences in their structure ? [05]
(b) Write note on : Zinc Metalloenzymes [05]

OR

Q:4 (a) Give a brief account on vitamin B_{12} [05]
(b) Write a note on : Rubridoxins and Ferridoxins [05]

Q:5 Write a note on hydroformylation reaction catalysed by dicobaltoctacarbonyl catalyst. [10]

OR

Q:5 Discuss the homogeneous hydrogenation of alkene by Rh based catalyst. [10]

Q:6 (a) Discuss the Dutch process for manufacturing of white lead. [05]
(b) Give the names of principal types of furnaces used in extraction of metals. Describe the Reverbatory furnace. [05]

OR

Q:6 (a) Describe the reactions involved during extraction of Iron giving neat diagram of blast Furnace. [05]
(b) What is matte ? Describe the extraction of copper from matte by Bessemer process. [05]

SEAT No._____ No. of Printed Pages : 2

[373A18]

SARDAR PATEL UNIVERSITY

B. Sc. Examination (Sixth semester)

Monday, 3rd April-2017

10.00 am to 1.00 pm

US06CCHE04 (Inorganic Chemistry)

Total Marks: 70

Q-1 Choose the most appropriate option for each of the following. **[10]**

i. _____ is not passivator.
(a) Chromic acid (b) Heating treatment (c) Conc. HCl (d) Conc. HNO_3

ii. The film deposited on the anode, _____ the resistance of a cell.
(a) cover (b) decreases (c) increases (d) neutralize

iii. _____ alloy consist of a single phase.
(a) Copper-zinc (b) Lead-tin (c) Silver-gold (d) Copper-nickel

iv. _____ is low melting alloy and have property of expansion on freezing.
(a) Fusible alloy (b) Wood's metal (c) Type metal (d) Light metal

v. Eutectic alloy of lead-tin has composition _____.
(a) 38% Tin-62% Lead (b) 50% Tin-50% Lead
(c) 62% Tin-38% Lead (d) 45% Tin-55% Lead

vi. _____ cannot form inter-halogen compounds.
(a) Chlorine (b) Iodine (c) Bromine (d) Fluorine

vii. The central I-atom of IF_5 molecule undergoes _____ hybridization.
(a) sp^3d (b) sp^3d^2 (c) sp^3d^3 (d) dsp^3

viii. _____ ion has angular shape.
(a) I_5^+ (b) I_3^+ (c) I_5^- (d) I_3^-

ix. Nitric acid oxidizes the non metal to their _____ .
(a) acids (b) base (c) highest oxy acids (d) lowest oxy acids

x. Valuable by-product obtain in _____ process during production of sodium hydroxide.
(a) caustisizing (b) lowing's (c) electrolytic (d)none of them

Q-2 Attempt any ten questions of following. **[20]**

(i) Define: (a) Electro-chemical passivity (b) Mechanical passivity

(ii) State the 'Pilling-Bedworth' rule of oxidation corrosion

(iii) Explain the term corrosion inhibitors.

(iv) Define the term solid solution.

(v) Explain the term alloy.

(vi) Explain the term 'brass and bronze'.

(vii) Explain why inter-halogens are more reactive than halogens?

(viii) Define polyhalides ions and polyhalides giving suitable example.

PTO

(ix) Explain IF_4^+ ion is AB_4(lp) type species.

(x) How metallic salts are affected by sodium hydroxide?

(xi) Give the main uses of nitric acid.

(xii) Explain concentration of chamber acid by Gaillard tower.

Q-3 Attempt the following.

(a) Explain the term 'passivity'. Explain passivity on the basis of oxide layer theory. **[05]**

(b) Discuss the factor affecting the rate of corrosion of metal sheltered rain. **[05]**

OR

Q-3 Attempt the following.

(a) What is meant by concentration cell corrosion? Explain briefly. **[05]**

(b) Describe the factors affecting the rate of chemical corrosion of metal. **[05]**

Q-4 Attempt the following.

(a) Discuss the general relationship (rules) established by careful study of inter-metallic compounds. **[05]**

(b) Write a note on melting point of alloy. **[05]**

OR

Q-4 Attempt the following.

(a) Discuss the effect of alloying and properties of alloys. **[05]**

(b) Discuss different types of steel of ferrous alloys with respect to their industrial application. **[05]**

Q-5 What is interhalogen compound? Why do they form? Give Preparation and Properties of BrF_3. **[10]**

OR

Q-5 Discuss shape of ClF_3 molecule, IF_7 molecule, $[ICl_2]^+$ ion and ICl_4^- ion on the bases of hybridization. **[10]**

Q-6 Attempt the following.

(a) Discuss the Birkland and Eyde process for the manufacture of nitric acid with required diagram and suitable theory. **[05]**

(b) Write note on Castner-Kellner cell. **[05]**

OR

Q-6 Attempt the following.

(a) Describe lead chamber process in detail for manufacture of H_2SO_4. **[05]**

(b) Discuss the chemical properties of nitric acid under the headings: **[05]**
(i) As an oxidizing agent for non-metals (ii) Action on more active metals.

– X –

SEAT No._____ No. of Printed Pages : 3

[13A]

SARDAR PATEL UNIVERSITY
B.Sc. (Semester – VI) Examination
Physical Chemistry
US06CCHE05

Date: - 08/04/2017 **Time: 10:00 am to 1:00 pm.**
Total Marks: 70

Note: - 1. Figure to the write indicates the full marks.
2. All questions are to be attempt.

Q.1. Choose the correct option and rewrite the following. **[10]**

1. Infrared radiation refers broadly to that part of the electromagnetic spectrum which lies between_____.
   (a) Visible and Microwave (b) Visible and Microwave
   (c) Microwave and Ultraviolet (d) Microwave and X-ray
2. Which of the following substances possess dipole moment?
   (a) N_2 (b) HCl (c) Cl_2 (d) O_2
3. The ratio of the sines of angle of incidence and that of angle of refraction is called _____.
   (a) Diffraction (b) Viscosity
   (c) Refractive Index (d) Dipole Moment
4. Which of the followings is the example of Additive properties?
   (a) Volume of the gases (b) Molecular viscosity
   (c) Osmotic Pressure (d) Mass or Weight
5. The relation between enthalpy of vaporization of liquid and normal boiling point temperature is given by _____.
   (a) Trouton's (c) Lewis
   (b) Gibbs Helmoltz (d) None of these
6. The relation between entropy and the number of arrangements is given by _____
   (a) $S = W \ln k$ (b) $S = K \ln W$ (c) $S = \ln(K W)$ (d) $S = K W$
7. If ΔG is negative for a reaction, then the reaction is _____.
   (a) The reaction is at equilibrium.
   (b) The reverse reaction can proceed spontaneously.
   (c) Can proceed spontaneously.
   (d) None of the above.
8. A colloidal solution consists of _____.
   (a) A dispersed phase
   (b) A dispersion medium
   (c) A dispersed medium in a dispersed
   (d) A dispersed phase in a dispersion medium
9. In true solutions, the diameter of the dispersed particles is in the range from _____.
   (a) $1A^0$ to $10\ A^0$ (b) $10A^0$ to $100A^0$
   (c) $100A^0$ to $200A^0$ (d) $200A^0$ to $500A^0$
10. Which one is the example of suspension_____?
    (a) sugar in water (b) clay in water
    (c) glue in water (d) starch in water

Q.2 **Answer the following. [Any Ten]** **[20]**

1. Define: (a) Scissoring (b) Rocking
2. Differenciate between IR spectroscopy and microwave spectroscopy.
3. By which factors the extent of coupling is influenced?
4. Write note on : Vapour Temperture Method
5. Explain the Levo and Dextro rotator isomers pf lactic acid with suitable example.
6. Explain the concept of refractive index with suitable diagram.
7. What is Free Energy? Write the criteria for spontaneous process.
8. Give the limitations of Truton's rule.
9. Derive the expression for the rotational entropy for linear molecules.
10. What are the Lyophilic sols? Give suitable example.
11. Define: (a) Peptization (b) Reversibla sol
12. Write note on: Purification of water.

Q.3 (a) Prove that moment of inertia of a rigid diatomic molecule is always equal to product of reduce mass of a molecule and square of intermolecular distances. [05]

(b) Calculate the theoretical number of vibrational degree of freedom in (a) Benzene (b) Carbon dioxide (c) Water (d) Sulphur dioxide (e) N_2O [05]

OR

Q.3 (a) Sketch and explain P-Q-R bands observed on IR spectra. [05]

(b) HBr has bond length of 1.40A^0. Calculate reduced mass, the moment of inertia and the rotational constant of the molecule. What would be the spacing factor of spectral line? Given : Atomic Wt. of H = 1 gm / mole
Atomic Wt. of Br = 80 gm / mole [05]

Q.4. (a) Derive the Clausius –Mosotti equation for the relationship between the polarizability of a molecule and the dielectric constant of the medium. [05]

(b) A substance of molecular formula C_2H_6O gives the molar refraction of 16.982cm^3.mol^{-1}. Indicate whether the substance is acetone (or) allyl alcohol. [Given : Rm value for C=2.591cm^3/g.atom, H=1.028 cm^3/g.atom, O in >C=O =2.573 cm^3/g.atom, O in –OH=1.518 cm^3/g.atom ,one double bond=1.575 cm^3/g.atom] [05]

OR

Q.4. (a) Define physical properties. How many types of physical properties. Discuss each in detail with suitable example. [05]

(b) Explain the fact that ethyl chloride has a dipole moment of 2.05D is considerably larger than that of Chlorobenzene. (μ = 1.70D) [05]

Q.5 (a) Derive the equation for molecular basis of entropy. Give its limitations. [05]

(b) Calculate the vibrational contribution to the entropy of 1 mole to CO at 1000^0C .The vibrational energy spacing factor $h\mu_{vib}$ is $4.26X10^{-20}$ J. [05]

OR

Q.5 (a) Drive the relation between $G = G^0 + RTInP$ [05]

(b) Calculate the total entropy of HCl at 25^0 C. The moment of inertia of HCl molecule is 2.679×10^{-47} kg.m^2 . The vibrational energy level spacing is 2885cm^{-1}. [Atomic weight of HCl is 36.5 gm/mole and σ=1.] [05]

Q.6 Discuss the purification of colloids. [10]

OR

Q.6 Distinguish between the Lyophilic sols and Lyophobic sols. [10]

**** BEST OF LUCK ****

SEAT No._____ No. of printed pages : 03

[227 A17]

SARDAR PATEL UNIVERSITY

B. Sc. [SEMESTER - VI] EXAMINATION

Friday , 7th April - 2017

10:00 A.M. TO 01:00 P.M.

PHYSICAL CHEMISTRY : US06CCHE06

Total marks: 70.

NB. Figures to the right indicates full marks.

Q.-1. Choose and rewrite the correct option for the following MCQs. [10]

1. Activation energy is equal to _____ minus energy actually possessed by molecules.
   (a) Chemical energy (b) Mechanical energy
   (c) Thermal energy (d) Threshold energy
2. For the Arrhenius equation : $k = A\, e^{-Ea/RT}$, which one of the term is dimensionless ? _____.
   (a) Rate constant k (b) Activation energy Ea
   (c) Exponential factor Ea/RT (d) Arrhenius pre exponential factor A
3. The temperature coefficient of the reaction may be expressed as the ratio of the,_____.
   (a) Two equilibrium constants (b) Two rate constants
   (c) (a) and (b) both (d) None of these
4. Which of the following molecule have symmetry number : $\sigma = 3$, _____
   (a) NH_3 (b) CH_4
   (c) H_2O (d) None of these
5. Which of the following is true : q = _____.
   (a) $q_{tra} \times q_{rot} \times q_{vib}$ (b) $q_{tra} + q_{rot} + q_{vib}$
   (c) $q_{tra} / q_{rot} / q_{vib}$ (d) $q_{tra} \times q_{rot} + q_{vib}$
6. Electrochemical detector belongs to _____ detectors.
   (a) Universal (b) Solute property
   (c) Bulk property (d) Selective
7. In HPLC , the maximum temperature is about _____ °C for silica columns.
   (a) 80 (b) 100
   (c) 120 (d) 140
8. The choice of mobile phase is very important in HPLC and the eluting power of the mobile phase is determined by, _____
   (a) Its overall polarity (b) Nature of sample components
   (c) Polarity of the stationary phase (d) All are correct
9. The greater the distribution ratio in favour of the organic solvent , the _____ will be the amount extracted in any one operation.
   (a) Lesser (b) Equal
   (c) Greater (d) All of these
10. Continuous extraction is used when the distribution ratio is, _____
    (a) High (b) Moderate
    (c) Low (d) All of these

(PTO)

Q.-2. Give the answer of **ANY TEN** questions. [20]

1. Explain the terms : (i) Franck-Rabinovich effect (ii) Rate determining step
2. Define the terms : (i) Transition state (ii) Catalyst
3. Can the activation energy of a reaction be zero or negative ? Explain.
4. Define the terms : (i) Thermal energy (ii) Degree of freedom
5. Write the mathematical form of Boltzmann distribution law.Explain each term involved in it.
6. On which molecular properties the value of translational , rotational and vibrational energies depends ?
7. Explain any two types of column packing in HPLC.
8. How the bulk property detector is differ from solute property detector.
9. Give the most important advantages of UV detector.
10. What are the limitations of Nernst distribution law ?
11. Name the factors that promote rate and selectivity of an extraction process.
12. The distribution law is very useful and frequently describes the actual experimental observation , but it is not exact. Why ?

Q.-3.

(a) Discuss kinetics of reversible reaction in which the forward as well as the reverse reactions are of first-order. [06]

(b) Calculate the activation energy of a reaction whose rate constant is tripled by a 10 °C rise in temperature in the vicinity of 27 °C. [$R = 8.314\ JK^{-1}mol^{-1}$]. [04]

OR

Q.-3.

(a) Discuss the Lindemann theory of unimolecular reactions . [06]

(b) For the first order isomerization of an organic compound at 130° C , the activation energy is 108.4 $KJmol^{-1}$ and the rate constant is $9.12 \times 10^{-4}\ sec^{-1}$. Calculate the standard entropy of activation for this reaction. [04]
[$R = 8.314\ JK^{-1}mol^{-1}$, $h = 6.626 \times 10^{-34}\ JS$, $k_B = 1.38 \times 10^{-23}\ JK^{-1}$]

Q.-4.

(a) Derive the general expression for the thermal energy of a collection of particles. With the help of this expression derive one dimensional translational thermal energy equation per mole of gas. [06]

(b) Bond length of N_2 is 120 pm and atomic mass of N is 14 $gmmol^{-1}$. The symmetry number of N_2 is 2. Calculate the rotational partition function of N_2 at 298 K. [$h = 6.626 \times 10^{-34}\ JS$, $k_B = 1.38 \times 10^{-23}\ JK^{-1}$, $\pi = 3.14$, $N_A = 6.023 \times 10^{23}$]. [04]

OR

Q.-4.

(a) Derive an expressions for one dimensional and three dimensional translational partition function of a gas molecules. [06]

(b) Calculate the thermal vibrational energy of one mole diatomic molecules with vibrational energy level spacing is $3 \times 10^{13}\ sec^{-1}$ at 1000° C. [04]
[$h = 6.626 \times 10^{-34}\ JS$, $k_B = 1.38 \times 10^{-23}\ JK^{-1}$, $R = 8.314\ JK^{-1}mol^{-1}$].

Q.-5. Explain solvent delivery system and pumps used in HPLC. [10]

OR

Q.-5. Give the important advantages of HPLC and choice of supporting materials used for separation in HPLC [10]

Q.-6.

(a) Show that PH of the chelating agent is a function of distribution of metal in two phases. [06]

(b) The distribution coefficient of succinic acid between ether and water is 3 at 20° C. What will be the amount of acid removed if 4 gm of succinic acid in 100 ml of water is extracted with 100 ml of diethyl ether at 20° C.What would be the effect if two successive 50 ml portion of ether has been used to extract the aqueous layer. [04]

OR

Q.-6.

(a) Discuss in detail factors that are responsible for affecting the process of solvent extraction. [06]

(b) An organic compound is extracted from aqueous solution with successive quantities of 25 ml chloroform. The original volume of solution is 500 ml and distribution coefficient of the compound is 20 between chloroform and water. Calculate the number of extractions required for atleast 95% recovery of the compound. [04]

********** ALL THE BEST **********

(a)

(b)

(a)

(b)

(41 & A-16) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
T.Y.B.Sc : SEMESTER – VI
COMPUTER SCIENCE
US06CCSC01: Object Oriented Programming using Java

Date: 27-03-2017, Monday Time: 10:00am to 01:00pm Max. Marks: 70

Q.1 Multiple choice of Question: 10

[1] Java interpreter translates _____ into machine code.
(a) Bitcode (b) Machine Code
(c) Bytecode (d) User code

[2] The _____ includes hundred of classes and methods grouped into several function packages.
(a) API (b) JVM
(c) JAVAC (d) JRE

[3] _____ is use for naming classes, methods, variables etc in a program.
(a) Operator (b) Separator
(c) Identifier (d) Constructor

[4] _____ constructor is created when object of particular class is created.
(a) Default (b) Parameterized
(c) Copy (d) None of these

[5] _____ methods must be override in the subclass.
(a) public (b) final
(c) abstract (d) static

[6] _____ keyword is used to inherit a class.
(a) extend (b) extends
(c) implement (d) implements

[7] _____ presents a uniform, easy-to-use, object-oriented interface between the program and the input/output devices.
(a) Reader (b) Output
(c) Input (d) Stream

[8] Which package is used for creating and implementing applets.
(a) java.lang (b) java.util
(c) java.applet (d) java.awt

[9] In itemStateChanged( ) method, we must pass object of _____ class.
(a) ItemEvent (b) EventAction
(c) EventItem (d) ActionEvent

[10] JDBC application must import _____ package.
(a) io (b) sql
(c) event (d) util

(P.T.O.)

Q.2	**Attempt any 10 questions:** **[1] List out the features of java.** **[2] What is JVM(Java Virtual Machine)?** **[3] Draw the java program structure.** **[4] Define static keyword.** **[5] Define fields and methods of a class in JAVA.** **[6] What are the restrictions with static methods?** **[7] List out the different types of exception.** **[8] Give examples of the Run-time error.** **[9] List the methods of Reader class.** **[10] List out methods of MouseListener.** **[11] Define Event Source.** **[12] Explain setBackground( ) method.**	**20**
Q.3	**Explain decision making statements available in java with example.**	**10**
	OR	
Q.3	**Explain loop statements available in java with example.**	**10**
Q.4	**[A] What is a constructor? What are its special properties?**	**5**
	[B] Define class. How do classes help us to organize our programs? What are the three parts of a simple, empty class?	**5**
	OR	
Q.4	**Describe the various forms of implementing interface. Give example of JAVA code for each case.**	**10**
Q.5	**What is package? What are the benefits of package? Explain Java API packages.**	**10**
	OR	
Q.5	**Define the terms: Exception, Try block, Catch block. Explain the syntax of try block and catch block with an example.**	**10**
Q.6	**Write short note on following:** **1. Label, 2. TextField, 3. drawPloygon**	**10**
	OR	
Q.6	**Write short note on following:** **1. Checkbox, 2. Button, 3. drawLine**	**10**

(21A & A-16) Seat No.: .....

No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY
External Examination (CBCS)
B. Sc. - VIth Semester (Computer Science)
US06CCSC02 : Relational Database Management System
28th March, Tuesday - 2017

Time : 10:00 am to 01:00 pm

Total Marks :70

Q-1 Select an appropriate option. 10

1. Which of the following is not three-schema architecture for a database?
   (a) Hierarchical (b) Physical (c) Network (d) Relational

2. Rows of the relation are referred as _____.
   (a) Relationship (b) Tuples (c) Attributes (d) Record

3. Which integrity constraint is used to maintain the consistency among in the two relations?
   (a) Entity (b) Referential (c) Domain (d) Primary

4. _____ Clause is use with select statement to arrange records in ascending order or descending order.
   (a) Order (b) Order by (c) Arrange (d) Arrange by

5. Maximum number of characters allowed in varchar data type is _____.
   (a) 250 (b) 255 (c) 4000 (d) 4500

6. _____ command is used to change a content of table.
   (a) Update (b) Modify (c) Change (d) Alter

7. For character data types the _____ sign matches any string.
   (a) _ (b) & (c) % (d) $

8. The _____ function returns number of months between two dates.
   (a) month_between (b) between (c) between_month (d) month

9. The _____ clause is another section of the selection of the select statement.
   (a) Group by (b) Having (c) Sub query (d) Where

10. To make the change permanent a _____ statement has to be given at the SQL statement.
    (a) Commit (b) Save point (c) Roll back (d) View

Q-2 Answer the following questions. (Attempt any **TEN**) 20

1. What is attributes?
2. What is domain?
3. List types of relationship.

(P.T.O.)

(1)

4. What is SQL? Write advantages and disadvantages of it.
5. What is DDL? List types of queries available under DDL.
6. Explain delete statement.
7. List all the operators used in SQL.
8. What is column level Constraints?
9. List all Scalar functions available in oracle.
10. What are indexes? List types of Index.
11. What is Inner Join?
12. Explain the use of Rollback.

Q-3 Explain E. F. codd rules. 10

OR

Q-3 What is ER modeling ? Explain in detail with diagrams. 10

Q-4

(a) Explain create statement with its syntax and example. 5
(b) Explain update and alter statement with appropriate syntax and example. 5

OR

Q-4

(a) List and explain various basic data types used in oracle. 5
(b) Explain how to filtering the data in oracle with suitable examples. 5

Q-5

(a) Define Primary key and foreign key concept with appropriate illustration. 5
(b) Write a note on UNIQUE key concept with example. 5

OR

Q-5

(a) Explain the concept of CHECK constraint with example. 5
(b) List all Aggregate functions available in oracle and explain any three of them with appropriate syntax and example. 5

Q-6

(a) Explain group by and having with example. 5
(b) What is Cursor? Explain Implicit Cursor attributes in detail. 5

OR

Q-6

(a) Write advantages of PL/SQL over SQL. 5
(b) What is use of Sequences? Explain creating & dropping it with example. 5

-X-
(2)

(38 & A-16) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. CS(Computer Science) Semester – VI

(CBCS) (2011 Batch Onwards)

Friday, Date: 31st March 2017

Session: Morning Time : 10:00 A.M. to 1:00 P.M.

Subject Code: US06CCSC03

Subject Title : Web Designing & Applications

Total Marks: 70

Q1. Multiple Choice Questions. (Attempt all) [10]

1. Which is a component of web browser?
   A. Status bar C. Address bar
   B. Title bar D. All of these
2. _____ software is used to access the internet.
   A. MS Office C. Browser
   B. Flash D. None of these
3. _____ is specialized software that can be used to search information of internet.
   A. MS Office C. Viber
   B. Search engine D. Skype
4. _____tag is used give biggest heading in HTML.
   A. <h1> C. <h6>
   B. <h4> D. <h8>
5. _____tag is used for line breaking.
   A. <bk> C. <break>
   B.
 D. <linebreak>
6. _____tag is used to add items in a list.
   A. C. <item>
   B. <listitem> D. <list>
7. _____ keyword is used to declare a variable in java script.
   A. dim C. declare
   B. dec D. var
8. Which is not a type of operator?
   A. Comparator C. Assignment
   B. Arithmetic D. comparison
9. Which is not an object of ASP?
   A. Application C. Response
   B. Session D. Query
10. _____ is used to identify a user on the internet.
   A. database C. cookie
   B. connection D. application

(P.T.O)

Q2. Answer the following short questions (Attempt any TEN) [20]

1. What is web server?
2. List the services provided by the internet.
3. List the components of Web browser.
4. Explain concept of Frame in brief.
5. State the use of MARQUEE tag?
6. What is Hyperlink?
7. Explain error handling in brief.
8. List the events used in JavaScript.
9. List the Control structure available in JavaScript?
10. Explain Session object in brief.
11. What is Response object?
12. Write a note about how to manage Cookies.

Q3. a. What is the use of Navigation and History button is browser? [05]

b. Explain the steps to save a web page for offline reading. [05]

OR

Q3.a. What is tabbed browsing? Explain in detail. [05]

b. Explain how to set basic options and privacy options in internet browser. [05]

Q4.a. Explain TABLE tag and its options with example in details. [05]

b. What is Ordered and Unordered list? Explain with suitable example. [05]

OR

Q4.a. Explain Text and Paragraph formatting with example. [05]

b. Explain the structure of HTML in details. [05]

Q5. What is Scripting? Explain Client side and Server side scripting in brief. [10]
Explain the advantages and disadvantages of Client side scripting.

OR

Q5. Explain any three control structure of JavaScript. [10]

Q6.a. What is Application object? Explain its methods and events. [05]

b. Write down the steps to connect with database. [05]

OR

Q6.a. Explain Request object in detail. [05]

b. Explain Record set in detail. [05]

— X —

(2)

SEAT No._____ No. of Printed Pages: 02

[14A]

SARDAR PATEL UNIVERSITY
External Examination (CBCS)
B. Sc. - VI[th] Semester (Computer Science)
US06CCSC05 : Software Engineering
8[th] April, Saturday - 2017

Time : 10:00 am to 01:00 pm Total Marks :70

Q-1 Select an appropriate option. 10

1. _____model provides better risk management and cost of each phase.
(a) Spiral (b) Prototype (c) Iterative enhancement (d) Waterfall

2. _____ part requires major efforts.
(a) Testing (b) Maintenance (c) Coding (d) Design

3. _____ is the second step of design phase.
(a) Design Analysis (b) System Design (c) Black box (d) Detail Design

4. _____ is the formal language used to specify the requirements.
(a) English (b) UDF (c) Structured English (d) Expressions

5. COCOMO stands for _____.
(a) Construction Cost Model (b) Constructive Cost Model
(c) Constructive Code Model (d) Calculated Cost Model

6. _____ is the method to identify the Risk.
(a) Risk Identification (b) Risk Analysis
(c) Risk Assessment (d) Risk Control

7. PDL stands for _____.
(a) Process Define Language (b) Prefer Define Language
(c) Procedure Design Language (d) Process Design Language

8. Structured design methodology tries to reduce _____.
(a) Cost (b) Time (c) Cohesion (d) Coupling

9. In structured design methodology the hierarchy of modules is represented by the _____.
(a) Flow chart (b) PERT chart (c) Gant chart (d) Structure chart

10. Comments for a module are often called _____ for the module.
(a) Prologue (b) Message (c) Information (d) None of these

Q-2 Answer the following questions. (Attempt any **TEN**) 20

1. Explain advantages of Spiral Model.
2. Explain error distribution.

(PTO)

3. What do you know about Prototype Model?
4. Justify: "A high quality SRS is prerequisite to high quality software".
5. Explain Partitioning.
6. Explain Risk Management.
7. Define: Module and Modular System.
8. Explain in brief Design walkthrough.
9. Differentiate between Top-down and Bottom-up approaches.
10. Write the goal of coding.
11. Define fault and failure.
12. Write at least 2 differences between functional and structural testing.

Q-3 Explain in detail the Phases of Software Development. 10

OR

Q-3 Explain in detail Waterfall Model. 10

Q-4

(a) What is SRS? Explain needs of SRS. 5
(b) Explain SQAP. 5

OR

Q-4

(a) Explain in detail the components of SRS. 5
(b) What is the importance of project monitoring plans? List the various methods for monitoring a project. Write in brief about any one of them. 5

Q-5

(a) Discuss the Design Objectives in detail with proper illustrations. 5
(b) Write a short note on Cohesion. 5

OR

Q-5

(a) Explain the Verification Techniques for Detailed Design. 5
(b) What is Design Specification? Explain factors of it. 5

Q-6

(a) List all the Programming Style rules to write the code in coding phase and explain any three of them. 5
(b) Explain the concept of information hiding in structured programming. 5

OR

Q-6

(a) What is verification process in coding phase and explain Code reading method. 5
(b) Explain the levels of testing. 5

— X —

SEAT No._____ No. of Printed Pages: 02

[2 39 A14]

SARDAR PATEL UNIVERSITY
External Examination (CBCS)
B. Sc. - VIth Semester (Computer Science)
US06CCSC06 : E-Commerce
7th April, Friday - 2017

Time : 10:00 am to 01:00 pm Total Marks :70

Q-1 Select an appropriate option. 10

1. Which of the following identifies a specific web page and its computer on the Web?
(a) Web site (b) Web site address (c) URL (d) Domain Name

2. _____ are networks that connect people within a company to each other and to the company network.
(a) Internets (b) Intranets (c) Extranets (d) Componets

3. Which of the following is not a type of EC?
(a) B2B (b) B2C (c) C2C (d) D2B

4. Future of Electronic Commerce consist which of the following ?
(a) Business to Business (b) Business to Consumer
(c) Consumer to Consumer (d) Consumer to Business

5. A company provides a forum for advertisements and receives fees from advertisers are known as _____.
(a) Advertising Revenue Model (b) Affiliate Revenue Model
(c) Subscription Revenue Model (d) Transaction Fee Revenue Model

6. A firm's _____refers to the other companies operating in the same market space selling similar products.
(a) Competitive Advantage (b) Competitive Environment.
(c) Revenue Model (d) Value Proposition

7. Customers interact with a marketplace via a _____.
(a) Front end (b) Middle agent (c) Back end (d) None of these

8. The matching of services, products and advertising content to individual consumers is known as _____.
(a) Personalization (b) Collaborative Filtering
(c) User Profile (d) Content Based Filtering

9. _____ deals with all the necessary communication, Co-ordination and collaboration between vendors and customers.
(a) Operational CRM (b) CRM
(c) Analytical CRM (d) Collaborative CRM

10. Which one of the following is the example of Sales Force Automation?
(a) Wireless Device (b) Wire able Devices
(c) Electronic Devices (d) Devices

(PTO)

Q-2 Answer the following questions. (Attempt any **TEN**) 20

1. Define Internet.
2. Define Firewall.
3. Explain Extranet Applications.
4. What is E-commerce?
5. Define Intra Business E-commerce with example.
6. Define Non-Business E-commerce with example.
7. What is Content Provider?
8. List the various types of stores and e-malls.
9. What are Information Portals?
10. Write the full-forms: (i) CIC (ii) CRM
11. Explain Collaborative Filtering and list out them.
12. Define Symmetric-Key algorithms.

Q-3

(a) What is Intranet? Explain Architecture of Intranet. 5

(b) Explain Benefits of Intranet and Extranet. 5

OR

Q-3

(a) What is Extranet? Explain Architecture of Extranet. 5

(b) Explain Applications of the Intranet. 5

Q-4

(a) What is E-Commerce? Write down classification of EC by Nature of transactions. 6

(b) Write down benefits to Organizations. 4

OR

Q-4

(a) Explain framework of E-Commerce. 6

(b) Write down limitations of E-Commerce. 4

Q-5

(a) Define Business Model. List key ingredients of a business model. Explain any two of them. 5

(b) List various market space components and explain any three of them in brief. 5

OR

Q-5

(a) Discuss the roles and values of intermediaries in e-markets. 5

(b) Write short note on E-market success factors. 5

Q-6 Explain CRM and types of CRM. 10

OR

Q-6 Give descriptions for classification of CRM applications. 10

—X—

(42 & A-21) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

BSc. (6th Semester) Examination

Monday, 27th March 2017

10:00 am to 01:00 pm

US06CELE01- Discrete And Linear Circuits

Total Marks: 70

Q.1 Multiple Choice Questions. [10]

1. Slew rate is defined as_____.
   (a) Moderate rate of change of output voltage with time
   (b) Maximum rate of change of output voltage with time
   (c) Minimum rate of change of output voltage with time
2. Voltage gain of an ideal Op-Amp is _____.
   (a) Very high (b) Infinite (c) Very low
3. Virtual ground of an Op-Amp means_____.
   (a) Terminal is not physically ground but terminal is zero due to other terminal is grounded
   (b) Terminal is grounded directly
   (c) None of the above
4. The output of relaxation oscillator is a_____.
   (a) Square wave (b) Sine wave (c) Ramp
5. An active Half wave rectifier has a knee voltage of _____.
   (a) more than 0.7 V (b) 0.7 V (c) much less than 0.7 V
6. Which transducer converts input form of signal to the charge ?
   (a) sensitor (b) thermistor (c) thermocouple
7. An Anti log amplifier has _____ in series with the input.
   (a) Diode or BJT (b) Diode (c) BJT
8. The circuit which adds dc voltage to the ac input signal is called _____.
   (a) Clipper (b) FVC (c) Clamper
9. _____ converts any irregular shaped waveforms into pulses.
   (a) Astable multivibrator (b) VCO (c) Schmitt trigger
10. The frequency over which PLL can maintain lock with incoming signal is called _____.
    (a) Input signal (b) lock in signal (c) output signal

Q.2 Answer **any Ten** Questions in brief. [20]

1. What are the advantages of active filters over passive filter ?
2. Design a first order high pass filter at a cutoff frequency 1 KHz with pass band gain of 2 for R1 = 10 K ohm and C= 0.001uF.
3. Draw the functional Block diagram of OP-Amp IC.
4. Explain the principle of precision rectifier.
5. Draw the circuit diagram and wave form of sample and Hold circuit.

[P.T.O]

6. Discuss in brief different types of multivibrators.
7. Draw the circuit of positive clipper and clamper using op-amp.
8. Derive the equation for log amplifier.
9. Draw the circuit of Charge amplifier and explain it.
10. Give some salient features of timer IC 555.
11. Draw the circuit of Water level controller using 555 Timer.
12. Define Free running, Capture and Lock state in PLL.

Q.3 Draw the circuit diagram of ideal integrator. What are its shortcoming ? How these are rectified in a practical integrator circuit. [10]

OR

Q.3 Draw the circuit diagram of an inverting amplifier using op-amp and obtain the expression for voltage gain. Explain how it can be used as a summer. [10]

Q.4 Draw the circuit diagram of Astable multivibrator using op-amp and explain its operation. [10]

OR

Q.4 Discuss in detail the Feedback diode comparator. [10]

Q.5 Draw the circuit diagram of temperature compensated Anti LOG amplifier and obtain expression for the output voltage. [10]

OR

Q.5 Draw the circuit diagram of Frequency to voltage conversion and explain it. [10]

Q.6 Draw the Astable Multi vibrator circuit using 555 Timer and explain its operation, also obtain the expression for the output time period (t) and Duty cycle (D). [10]

OR

Q.6 Draw the circuit of Monostable multivibrator using 555 timer and explain its operation, also obtain the expression for the period of output pulse. [10]

---------- X ----------

(22 A & A-21) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

BSc. (6th Semester) Examination

Tuesday, 28th March 2017

10:00 am to 01:00 pm

US06CELE02- Digital Systems

Total Marks: 70

Q.1 Multiple Choice Questions. [10]

1. The full form of ROM is _____.
   (a) Right Organization Memory (b) Re arrange Memory
   (c) Read Only Memory
2. Retrieving data from the memory is called _____.
   (a) writing memory (b) reading memory (c) modifying memory
3. Fusible links are used in _____ type of memory.
   (a) EPROMs (b) ROMs (c) PROMs
4. The Static RAM can store data as long as _____ is applied to the chip.
   (a) bytes (b) bits (c) Power
5. _____ memory technology needs the least power.
   (a) PMOS (b) CMOS (c) NMOS
6. Another name of counter type ADC is _____.
   (a) analog ramp (b) digital ramp (c) both (a) & (b)
7. Op-Amp is used as a _____in a successive approximation.
   (a) Inverting amplifier (b) Non-inverting Amplifier (c) Comparator
8. ADC 0801 is a _____ pin IC.
   (a) 20 (b) 24 (c) 28
9. _____comparators are required to construct n-bit flash type A/D converter.
   (a) 2^n (b) 2^n-1 (c) 2^n+1
10. Different values of resistor are used in _____ type of D/A converter.
    (a) 2R-R (b) R-2R (c) Weighted resistor

Q.2 Answer **any Ten** questions in brief. [20]

1. Give the difference between program memory and data memory.
2. Give the classification of ROM.
3. What is t_{ACC} ?
4. State the differences between static RAM and Dynamic RAM.
5. What are the applications of SRAM.
6. Draw the figure of dynamic memory cell and explain it in brief.

[P. T. O]

7. List the parameters of DAC.
8. What are the advantages and disadvantages of Flash type A/D convertor.
9. Calculate the number of resistors and comparators required in 3-bit simple Flash type A/D convertor.
10. Draw the block diagram of successive approximation A/D converter.
11. List the specifications of A/D converter.
12. What do you mean by A/D conversion ?

Q.3 Discuss in detail RAMs, ROMs and PROM. [10]

OR

Q.3 Discuss the role of memory in a computer system. [10]

Q.4 Discuss in detail the different types of ROMs. [10]

OR

Q.4 Explain in detail semiconductor RAMs. [10]

Q.5 Explain the R-2R ladder type DAC in detail. [10]

OR

Q.5 Discuss in detail Counter type A/D converter. [10]

Q.6 Explain voltage to frequency type A/D converter. [10]

OR

Q.6 Discuss in detail voltage to Time A/D converter. [10]

---------- X ----------

(39 & A-21) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

BSc. (6th Semester) Examination

Friday, 31st March 2017

10:00 am to 01:00 pm

US06CELE03 - 8-bit Microprocessor programming and applications

Total Marks: 70

Q.1 Multiple Choice Questions. [10]

1. _____instruction is used to increment the content of memory location by 1.
   (a) ADD M (b) INR M (c) DCR M
2. Rotate accumulator right instruction is _____.
   (a) RLC (b) RAR (c) RRC
3. _____instruction used to divide the 8-bit hexadecimal number by 2.
   (a) RRC (b) RLC (c) RAR
4. The beginning of the stack is defined in the program by using ____instruction.
   (a) LXI H, 16 bit (b) LXI Sp, 16 bit (c) LXI B, 16 bit
5. When PUSH is executed the stack pointer register is _____.
   (a) Incremented by 2 (b) Decremented by 2 (c) Both (a) & (b)
6. The decimal equivalent of FFH is equal to_____.
   (a) 155 (b) 255 (c) 100
7. If A=9FH then after execution of ANI 0FH the content of Accumulator is _____.
   (a) 09 (b) F0 (c) 0F
8. The equivalent ASCII Hex code for F is _____.
   (a) 45 H (b) 46 H (c) 36 H
9. The short form for set interrupt mask is _____.
   (a) SIM (b) RIM (c) EF
10. _____instruction is use to perform the function of adjusting a BCD sum in the 8085 instruction set.
    (a) ADD R (b) DAD Rd (c) DAA

Q.2 Answer **any Ten** questions in brief. [20]

1. List the compare instructions.
2. Write a program to load 2BH in register B, multiply 2BH by 2 using rotate instruction, specify the result.
3. List the arithmetic instructions related to memory.
4. List the conditional and unconditional CALL and RETURN instructions.
5. Define Stack and Subroutine.

[P.T.O]

6. List the instructions related to STACK.
7. State different techniques of dynamic debugging.
8. Briefly explain ASCII code.
9. Write down the subroutine to convert ASCII hex to binary.
10. Explain EI and DI instructions briefly.
11. By how many ways we can reset the flip-flop in the interrupt process.
12. How many types of interrupts are there in 8085 ? List them.

Q.3 Six bytes of data are stored in memory locations starting at XX50 H. Add all the data bytes. Use register B to save any carries generated while adding the data bytes. Display the entire sum at two output ports. Draw the necessary flow chart with program. [10]

OR

Q.3 Explain compare instructions in detail. [10]

Q.4 (a) Write a program to count continuously in hexadecimal from FFH to 00H in a system with 0.5 μs clock period. Use register C to set up a 1 ms delay between each count and display the numbers at one of the output ports. Draw the necessary flow chart. [06]

(b) Explain Stack instructions in detail. [04]

OR

Q.4 (a) Write a program to count from 0 to 9 with a one second delay between each count. At the count of 9 the counter should reset itself to 0 and repeat the sequence continuously. Use register pair HL to set up the delay. Display each count at one of the output ports. Assume the clock frequency of the micro computer is 1 MHz. [06]

(b) Explain advanced subroutine concepts. [04]

Q.5 Write a main program and subroutines to convert BCD to seven segment LED CODE conversions. [10]

OR

Q.5 Write a program with subroutine for Binary to ASCII Hex code conversion. [10]

Q.6 Explain 8085 Vectored Interrupt. [10]

OR

Q.6 Explain EI, DI, SIM, RIM instructions in detail. [10]

---------- X ----------

SEAT No._____ No. of Printed Pages : 3

[394A20]

SARDAR PATEL UNIVERSITY
B. Sc (6th Semester)
US06CELE-04
Instrumentation Paper II
APRIL-2017

3/04/17, Monday
10.00 am to 1.00 pm
Total Marks 70

Q.1 Multiple Choice Questions: 10.

1. A source follower circuit following the emitter follower circuit increases input impedance by
   (i) 100 fold
   (ii) 1000 fold
   (iii) 10 fold
   (iv) 10000 fold

2. Complex waveforms are most accurately measured by
   (i) average responding voltmeter
   (ii) true rms responding voltmeter
   (iii) direct responding voltmeter
   (iv) none of the above

3. Rectifiers converts
   (i) ac to dc
   (ii) dc to ac
   (iii) dc to dc
   (iv) ac to ac

4. Eye ball errors are present in
   (i) digital meters
   (ii) analog meters
   (iii) Q-meter
   (iv) none of the above

5. The Quality factor Q is ratio of
   (i) resistance to reactance
   (ii) reactance to resistance
   (iii) resistance/impedance
   (iv) None of the above

(PTO)

6. The stylus (Pen) consist of a ----------wire moving across the aluminium surface.

(i) Copper
(ii) Tungsten
(iii) Nichrome
(iv) Aluminium

7. Impact printing can record data up to --------- variables simultaneously.

(i) 15
(ii) 10
(iii) 20
(iv) 25

8. In optical writing, special photo sensitive chart paper sensitive to ----------is used

(i) visible light
(ii) ultraviolet light
(iii) infra red light
(iv) None of above

9. The acronym ATE stands for

(i) Analog test equipment
(ii) Automatic test equipment
(iii) Analog transfer equipment
(iv) Automatic transformer equipment

10. The IEEE 488 standard is based on the transmission of ------bit data bus

(i) 16
(ii) 8
(iii) 32
(iv) 4

Q. 2 Answer any **Ten** questions in short. 20

1. Draw circuit of amplified DC voltmeter with FET input?
2. What is difficulty with thermocouple in using it in true RMS responding voltmeter?
3. How input impedance is increased in case of amplified DC meter?
4. What is use of SH circuit? Draw its circuit.
5. What is principle of basic Q meter circuit?
6. Which components are measured using series connection method of Q meter.

7. List the types of recorders you know?
8. Explain briefly Thermal writing
9. Draw diagram of X-Y recorders?
10. Draw the 24 pin connector of IEEE 488 bus and label them.
11. Draw circuit of Automatic Test Equipment to test an audio amplifier.
12. What is IEEE 488 system?

Q.3 Explain in detail working of amplified DC voltmeter. 10

OR

Q.3 Explain in detail working of True RMS responding voltmeter. 10

Q. 4 Obtain expression for various components using series connection method of Q meter. 10

OR

Q.4 Describe working Ramp type Digital Voltmeter. 10

Q.5 What are recorders used for? Discuss in detail Magnetic recorders. 10

OR

Q.5 Explain with neat diagram XY recorder. 10

Q.6 Name eight interface or status lines of IEEE 488 system and state their function. 10

OR

Q.6 Give detail account of how radio receiver is tested using Automatic Test Equipment. 10

**********BEST OF LUCK **********

SEAT No._____ No. of Printed Pages : 2

[15A]

SARDAR PATEL UNIVERSITY

BSc. (6th Semester) Examination

8th April 2017

10:00 am to 01:00 pm

US06CELE05 - Industrial Electronics

Total Marks: 70

Q.1 Multiple Choice Questions. [10]

1. A large value of inductor in the bridge circuits results in _____ in the load.
   (a) very high current (b) discrete current (c) continuous current
2. In symmetrical configuration of half control Bridge circuit, the _____ period of thyristors and Diodes are equal.
   (a) Conduction (b) In-Active (c) Active
3. Free wheeling diode is used in_____.
   (a) Type C chopper (b) Type A chopper (c) phase controlled circuits
4. When the chopper is ON the supply terminals are ____ to the load terminals.
   (a) Disconnected (b) Connected (c) Open
5. In current limit control method when the current _____ the upper limit the chopper is switched OFF.
   (a) Equals (b) Exceeds (c) Less than
6. Single phase bridge controlled circuit consist of _____ SCRs.
   (a) 2 (b) 6 (c) 4
7. The _____ quadrant chopper is used for motoring operation of DC motor load.
   (a) First (b) Second (c) Third
8. _____ is a programmable controller which handles binary inputs and outputs related by logic statements.
   (a) PLC (b) Microcontroller (c) Microprocessor
9. _____ is a set of conductors needed to communicate.
   (a) Fiber (b) Cables (c) Bus
10. _____ on a chip is called microprocessor.
    (a) ALU (b) CPU (c) Control unit

Q.2 Answer **any Ten** Questions in brief. [20]

1. What is bridge configuration ?
2. Give a comparison of B-2 and M-2 connection.
3. Why power controlling is needed ?
4. State the principle of step up chopper.

[P.T.O]

5. What is step up/ step down chopper ?
6. What is a Chopper ?
7. Why second quadrant or Type B chopper is called step up chopper ?
8. What is regenerative breaking ?
9. Differentiate between Type A and Type B chopper.
10. What is a register ?
11. What is the program ?
12. What is the function of clock in micro computer ?

Q.3 (a) Draw the circuit of Half wave phase control circuit and explain its working. [06]

(b) Write a note on application to speed control of motors. [04]

OR

Q.3 Explain the working of half controlled bridge circuits. [10]

Q.4 Discuss in detail the various control strategies of chopper operation. [10]

OR

Q.4 (a) Discuss the basic chopper operation. [05]

(b) Discuss in detail the operation of step up chopper. [05]

Q.5 (a) Draw the circuit of First quadrant or Type A chopper and explain its working. [05]

(b) Draw the circuit of second quadrant or Type B chopper and explain its working. [05]

OR

Q.5 Draw the circuit of two quadrant Type A or Type C chopper and explain its working giving necessary waveforms. [10]

Q.6 Discuss the different definitions and terminologies used in digital control system. [10]

OR

Q.6 Draw the basic configuration of PLC and discuss it in detail. [10]

---------- X ----------

SEAT No._____ No. of Printed Pages : 2

[247A19]

SARDAR PATEL UNIVERSITY

BSc. (6th Semester) Examination

Friday, 7th April 2017

10:00 am to 01:00 pm

US06CELE06 - Analog Communication and Fiber optics

Total Marks: 70

Q.1 Multiple Choice Questions. [10]

1. Among the following colours for which the response of human eye is minimum.
   (a) red (b) green (c) violet
2. In shadow mask colour picture tube the electron guns are placed 120 degrees apart in the rear neck of the tube and is called _____ gun assembly
   (a) Triangular (b) cylindrical (c) Delta
3. Which of the following is not associated in optical communication.
   (a) dispersion (b) antenna (c) numerical aperture
4. The angle of incidence at which the refraction angle becomes_____ degrees is called critical angle.
   (a) 45 (b) 60 (c) 90
5. Optical Fiber communication is the transmission of information by conversion of an electrical signal into an_____ signal.
   (a) Sound (b) Optical (c) photoelectric
6. The photo diode operates on the principle of _____.
   (a) photo absorption (b) photo emission (c) photo conduction
7. A LED is a solid state PN junction device which emits light when it is _____ biased.
   (a) Not (b) Reverse (c) Forward
8. In_____ the signal is detected, amplified and re-emitted.
   (a) demodulator (b) repeater (c) amplifier
9. _____ is required in optical fiber to repair a broken connection or to extend an optical link.
   (a) Welding (b) Soldering (c) Splicing
10. The optical source used in fiber optic communication system is _____.
    (a) Phototransistor (b) Photodiode (c) LED

Q.2 Answer **any Ten** in brief. [20]

1. Which colours are known as primary and complementary primary colours.
2. State the principle of subtractive mixing.
3. What is the principle of Trinitron colour picture tube ?
4. Explain how total internal reflection of light ray is taking place at core cladding interface of fiber ?
5. What is graded index fiber ?

[P.T.O]

(43 & A-20) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

T.Y. B.Sc (6th Semester) EXAMINATION

Monday, 27Th March 2017

10.00 a.m. to 1.00 p.m.

Environmental Science

US06CENV01 Environmental Microbiology

Total Marks :70

Q1. Write the correct answer in given answer sheet **(10)**

1. Volcanic eruptions are a major source of _____
   (a) Carbon (b) Sulphur (c) Nitrogen (d) Iron
2. Ammonification is a part of _____ cycle
   (a) nitrogen (b) sulphur (c) Iron (d) Phosphorus
3. Vermicoposting involves the organism _____.
   (a) algae (b) fungi (c) earthworm (d) bacteria
4. _____ is a biocide.
   (a)Neem (b)Tulsi (c) both a&b (d)none
5. The algae used in biofertilzer is _____
   (a) Anabaena (b) Volvox (c) Batrachospermum (d)Zygnema
6. Biodiesel requires _____ modification to diesel engine for use
   (a) Extensive (b) minor (c) complete (d) no
7. The byproduct of diesel extraction from Jatropha are _____
   (a) Oil cake (b) Glycerine (c) Oil cake& glycerine (d) None of these
8. Fermentation process results in production of alcohol and ____ gas
   (a) Oxygen (b) Carbon dioxide (c) Chlorine (d) Methane
9. Out of 20 amino acids only _____ are essential amino acids
   (a) five (b) Eight (c) Eleven (d) fourteen
10. _____ is also called as Baker's yeast
    (a) Candida (b) Saccheromyces (c) Penicillium (d) Torula

Q.2 Answer in brief (Any Ten) **(20)**

1. What are Saprotrophs? Explain giving examples
2. Make a schematic diagram of Iron cycle.
3. Give an account of Phosphate solubilising bact
4. What is Ectomycorrhiza?
5. Name some biofertilisers.
6. Write a note on Biocide
7. State in brief the resources of Biomass for fuel generation
8. Give a brief account of Jatropha plant
9. What are the advantages of Biodiesel ?
10. Explain Composting in Mushroom cultivation
11. Which are the organisms used for SCP production?
12. What is Single Cell Protein ?

Q3. **(a)** Discuss the Carbon cycle with suitable diagram **(05)**
(b) Write a descriptive note on Sulphur cycle. **(05)**

OR

Q3. **(a).** Explain in detail the nitrification process with microbes involved **(05)**
(b) Write in brief about Saprotrophs and Lithotrophs. **(05)**

(P.T.O.)

Q.4. Give a detailed account on Biofertilisers. **(10)**

OR

Q.4. Describe the process of making Vermicompost. **(10)**

Q.5. (a) What is Biofuel ? Discuss the salient features of Biodiesel **(05)**

(b) Write a brief note on Aquatic Biomass **(05)**

OR

Q.5 (a) Discuss the morphology and cultivation of Jatropha. **(05)**

(b) Write a note on Biogas production **(05)**

Q.6. Discuss in detail the process of Mushroom cultivation **(10)**

OR

Q.6 (a) Discuss the production of *Chlorella* for SCP Production **(05)**

(b) Write a brief note on Food spoilage **(05)**

XXXXXXXX

(23A & A-20) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

T. Y. B. Sc. (SIXTH SEMESTER) EXAMINATION

2017

TUESDAY, 28th MARCH

Time: 10.00 a.m. to 1.00 p.m.

US06CENV02 (ENVIRONMENTAL SCIENCE)

(ENVIRONMENTAL TOXICOLOGY)

Note: 1. Answers of all the questions (including multiple choice questions) should be written in the provided answer book only

2. Figures to the right indicate the full marks of sub question

3. Draw neat and labelled diagrams wherever necessary

Maximum Marks: 70

Q. 1. Multiple choice questions **(10)**

1. Contaminant transport in air occurs primarily by _____ processes.
   a. Diffusional **b.** Decompositional **c.** Evaporational **d.** All of these
2. _____ can lead to both increase and reduction in exposure.
   a. Solubility **b.** Adsorption **c.** Volatility **d.** Non-solubility
3. _____is a method of preserving food in an edible anti-microbial liquid.
   a. Pickling **b.** Sugaring **c.** Vacuum-Packing **d.** Heating
4. _____is the best practice documenting hazard evaluations in detailed and standardized way.
   a. Anticipation **b.** Evaluation **c.** Recognition **d.** Prevention
5. An infection caused by *Shigella* bacteria is known as _____.
   a. Bacillary Dysentery **b.** Shigellosis **c.** Both of these **d.** None of these
6. Drinking water level of 0.6-0.8 ppm of Arsenic caused _____ disease in Latin America.
   a. Itai-Itai **b.** Minamata **c.** Black-foot **d.** Foot and Mouth
7. Renal carcinoma is observed in mammals with chronic exposure to _____.
   a. Chromium **b.** Cadmium **c.** Lead **d.** Cyanide
8. _____ chromium is powerful oxidant and can pass through RBC membrane.
   a. Divalent **b.** Trivalent **c.** Pentavalent **d.** Hexavalent
9. Eating or drinking a product not meant to be consumed may cause _____.
   a. Polie's syndrome **b.** Homicide **c.** Autointoxication **d.** Unintentional intoxication
10. Substances, used to preserve food by retarding deterioration, rancidity or discolouration due to oxidation are called _____.
    a. Antioxidants **b.** Anticacking agents **c.** Pickling agents **d.** Antimicrobial agents

(P.T.O.)

Q. 2. Answer the following questions in short (Any Ten) **(20)**

1. What is occupational Toxicology?
2. What is Accumulation *sensu lato* and *sensu stricto*?
3. What is chemodynamics?
4. Write about role of Industrial Hygienist
5. Write briefly on burial method
6. Write a short note on food preservation
7. What is Itai Itai disease?
8. Write the sources of Arsenic
9. Write the symptoms of fluoride toxicity.
10. What is food intolerance?
11. Name common food contaminants
12. What is homicide?

Q. 3. What are biomarkers? Write a detailed note. **(10)**

OR

Q. 3. **(a)** Describe about transport of toxicants in soil environment **(05)**

(b) Write a note on Ecotoxicological risk assessment **(05)**

Q. 4. **(a)** Write differences between Industrial hygienists and Occupational Hygienist **(05)**

(b) Explain in detail: Food contamination caused by bacteria **(05)**

OR

Q. 4. **(a)** Write a note on General Guidelines to Prevent Food Poisoning **(05)**

(b) Discuss Food Protection Program and National diet and nutrition survey **(05)**

Q. 5. **(a)** Write a short note on: Minamata disease **(05)**

(b) Write a note on Chromium Toxicity **(05)**

OR

Q. 5. **(a)** Illustrate the Preventive measures of Cadmium toxicity **(05)**

(b) Describe the toxic effects of Lead **(05)**

Q. 6. **(a)** Name direct food additives and describe any one in detail **(05)**

(b) Write briefly about acute and chronic intoxication **(05)**

OR

Q. 6. Write a detailed note on safe home food storage **(10)**

— x —

(2)

(40 & A-20) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B. Sc. SIXTH SEMESTER EXAMINATION
2017
FRIDAY 31st MARCH
10:00am to 01:00 pm
USO6CENV 03
(Waste Management)

TOTAL MARKS 70

Note: 1. Answers of all the questions (including multiple choice questions) should be written in the provided answer sheet
2. Draw neat and labeled diagram wherever necessary

Q1 Answer the following multiple choice questions **(10)**

1. BOD is a _____ characteristic of water
(a) Organic (b) Heavy metal (c) Inorganic (d) Hazardous

2. pH is a _____ character of water
(a) Chemical (b) Physical (c) Biological (d) Hazardous

3. Financially, state government can give _____% subsidy of the total cost for waste water project
(a) 35 (b) 45 (c) 25 (d) 55

4. Principal sources of _____ are garbage, cooking oils and fats
(a) Natural fibers (b) Carbohydrates (c) Proteins (d) Lipids

5. _____ of solid waste is usually expressed as mass of moisture per unit mass of weight or dry material
(a) Moisture content (b) Volume (c) Particle size (d) Density

6. Untreated biomedical waste can be stored for not more than _____ hours
(a) 24 (b) 48 (c) 36 (d) 72

7. Hazardous waste contains alcohol by volume more than _____ %
(a) 16 (b) 18 (c) 24 (d) 20

8. _____ is the process of transfer of a yarn or thread from one type of package to another
(a) Winding (b) Weaving (c) Slashing (d) Scouring

9. _____ breaks up and disperses milk fat throughout the milk to prevent cream from rising to the top
(a) Mixing (b) Homogenization (c) Stirring (d) none of these

10. _____ process is carried out in the furnace with the addition of sodium sulphate in pulp and paper industry
(a) Pyrolysis (b) Heating (c) Incineration (d) Boiling

(P.T.O.)

Q2. Answer the following questions. (Any ten) **(20)**

1. Discuss the main objectives of CETP
2. Explain in brief primary treatment for waste water
3. Write about activated sludge process?
4. What are industrial wastes?
5. Define: recycling
6. Write in brief about landfilling
7. Define biomedical waste
8. What is incineration?
9. Write note on reactivity as a characteristic of hazardous waste
10. Enlist the sources of wastes from diary industry
11. Explain chemical recovery of Kraft process
12. Name the wet operations of textile industry

Q3. (a) Explain the chemical treatment for waste water **(06)**

(b) Write note on full public ownership **(04)**

OR

Q3. Give a detailed note on various processes of CETP with flow diagram **(10)**

Q4. Write note on:

(a) Recycling of paper **(06)**

(b) On site handling of solid waste **(04)**

OR

Q4. Write note on:

(a) Transfer stations and different methods to transport solid waste **(06)**

(b) Types of collection systems for solid waste **(04)**

Q5. (a) Give an account of categories of biomedical waste according to Schedule 1 **(06)**

(b) Discuss the colour coding and type of container for disposal of biomedical waste **(04)**

OR

Q5. (a) Explain the various characteristics of hazardous waste **(06)**

(b) Describe Bubbling Fluidized Bed Incineration to treat hazardous waste **(04)**

Q6. (a) Draw a simplified flow diagram of Kraft Pulp and Paper mill **(05)**

(b) Explain in detail dry operations of textile industry **(05)**

OR

Q6. (a) Discuss leather production **(05)**

(b) Explain in detail Physical, Chemical and Biological treatments used for Pharmaceutical waste water **(05)**

ALL THE BEST

SEAT No._____ No. of Printed Pages : 2

[409A19]

SARDAR PATEL UNIVERSITY
THIRD YEAR B.Sc.(SIXTH SEMESTER) EXAMINATION 2017
MONDAY, 3rd APRIL
10:00 am TO 1:00 pm
USO6CENV 04 (OCEANOGRAPHY AND REMOTE SENSING)

Marks: 70

Note: 1. Answers of all the questions (including multiple choice questions) should be written in the provided answer book only
2. Draw neat and labelled diagrams wherever necessary

Q.1. Select the correct answer and write it in the answer sheet. **[10]**

1. In total global water fresh water is having _____ %
a) 72.5 b)6.5 c) 2.5 d) 96.5

2. Water with a salinity between this level and 1% is typically referred to as _____
a) Ground water b) continental water c) marginal water d) below water

3. The continental shelf and the slope are part of the _____
a) continental margin b) continental ridge c) deep sea plain d)guyot

4. _____is the ratio of velocity to hydraulic gradient indicating permeability of porous media
a) Darcy's law b) Hydraulic conductivity c) Head loss d) Permeability

5. The movement of water on the earth's surface and through the atmosphere is known as_____
a) Hydrologic cycle b) Ecological Cycle c) Biogeochemical Cycle d) None of these

6. _____ is the study of interactions between organisms and the hydrologic cycle.
a) Hydrogeology b) Chemical hydrology c) Ecohydrology d) Isotope Hydrology

7. EMR is abbreviation for _____
a)Electro Magnetic Radiation b) Electro Management Radio
c) Electro Mosaic Radiance d) Electro Management Radiance

8. Dominant factors controlling leaf reflectance in the region from _____ μm
a)0.20-0.40 b) 0.46-3.4 c) 0.25- 1.3 d) 0.35 – 2.6

9. There are mainly _____ stage methodology of soil mapping
a)three b) five c) four d) six

10. FSI is abbreviation of _____
a) Forest Survey of India b) Forestry of Surrounding India
c) Forest officer Serving India d) Forest Soft tool of India

Q.2. Answer the following. (Any ten) **[20]**

1. Give a note on guyot.

2. What is continental margin?

(PTO)

3.Discuss continental shelf

4. Write a short note on Hydraulic Conductivity

5.Define : Darcy's law

6.Write a note on Porosity and Permeability

7.Draw a labelled diagram for electro magnetic spectrum

8.Discuss in brief on satellite-IRS 1A, 1B

9.How we can interpret spectral characteristics of vegetation?

10.Give a note on CAPE methodology

11.Write a short note on geological application of remote sensing

12.How remote sensing helps in crop inventory?

Q.3.(a)Discuss temperature and salinity of ocean water (06)
(b)Give a note on neap tides (04)

OR

Q.3.(a)Define oceanography and discuss distribution of world land and water bodies (06)
(b) Give a note on mid ocean ridge (04)

Q.4.(a)Write a detailed note on hydrologic cycle (05)
(b)Discuss water table and movement of ground water (05)

OR

Q.4.(a) Explain in detail pollution of ground water (05)
(b)Discuss balancing withdrawal and recharge of ground water (05)

Q.5. (a)Give a note on Atmospheric windows (05)
(b)Discuss various principles of remote sensing (05)

OR

Q.5. (a) Define remote sensing with spectral signature (05)
(b)What are sensors and satellites? (05)

Q.6 (a)How remote sensing helps in forestry? (06)
(b) Write a note on GIS with its components (04)

OR

Q.6 Give a detail account on digital image processing with suitable flow chart (10)

—X—

SEAT No._____ No. of Printed Pages : 2

[16A]

SARDAR PATEL UNIVERSITY
T.Y.B.Sc.6th SEMESTER EXAMINATION
8th April 2017
10.00 AM to1.00 PM
Ethnobiology,Biodiversity,Forestry &Wildlife(US06CENV 05)
Total Marks-70

Q.1 **Multiple Choice Questions (one mark each)** 10

1. The study of various diseases among women in primitive societies is called _____ .

   (a)Ethnonarcotics(b)Ethnogynaecology(c)Ethnomedicine (d)Ethnopharmacology

2. *Aegle marmelos* is commonly known as _____tree.

   (a)Mango (b)Banyan (c) Billi (d) Peepal

3. Biodiversity includes the following_____ life forms.
   (a)plant (b)animal (c) microbe (d) all
4. The headquarter of IUCN is at _____ .
   (a)Switzerland (b)Geneva (c) Malaysia (d)Japan
5. _____ results in loss of biodiversity.
   (a)monoculture (b) polyculture (c) both (d) none
6. Gums contain a large quantity of_____.
   (a)sugar (b)lignin (c)alcohol (d)resin
7. _____ forestry is plantation and management of trees on private lands.

   (a)farm (b)community (c) agroforestry (d) silviculture

8. Gujarat has _____ national parks .

   (a)3 (b)4 (c)6 (d) 7

9. Velavadar National Park is a _____.
   (a)grassland (b)dense forest (c)thorny forest (d)saline area
10. Wild life game keeping is a part of_____ .

    (a)forest system(b)water management(c)pet keeping(d)wild life management

C 1 3

CRTO

Q.2	**Answer any ten**	20
1	Define the term Ethnotaxonomy.	
2	Discuss any 2 plants used by tribals as a source of shelter.	
3	Discuss the use of *Cocos nucifera*.	
4	Name some endangered species of India.	
5	Write about benefits of forests in biodiversity.	
6	What are biodiversity hotspots?	
7	What is agroforestry?	
8	Discuss the reasons for deforestation.	
9	Write the economic importance of *Tectona grandis*.	
10	Write the role of agriculture in wildlife.	
11	Explain some animal trade practice.	
12	What is the importance of wildlife.	
Q.3	(a) Describe in detail the methods of Ethnobotanical studies.	5
.	(b)Write a note on plants of medicinal value.	5
	OR	
Q.3	(a)Discuss the sub-disciplines of Ethnobotany.	5
	(b)Comment on the role of tribals in conservation of Ethnobotanical heritage.	5
Q.4a.	Write about IUCN.	5
b.	Write a note on significance of biodiversity.	5
	OR	
Q.4a.	Write about Biodiversity indices.	5
b.	Explain about loss of biodiversity.	5
Q.5a.	Give a general account on Social forestry.	5
b.	Discuss forest conservation strategies.	5
	OR	
Q.5a.	What are fibres?Give the classification and explain with suitable examples.	5
b.	Write a note on Gums and Resins.	5
Q.6	Give an overview of Wild life.	10
	OR	
Q.6	Write a detailed account on threats to Wild life	10

—X—

No. of Printed Pages : 2

SEAT No._____

SARDARPATELUNIVERSITY

THIRD YEAR B.Sc.(SIXTH SEMESTER) EXAMINATION

Environmental Science

[257A18]

2017

FRIDAY, 7th APRIL

10:00 am to 1:00 pm

US06CENV06 Environmental Issues and Legislation

Marks: 70

Q.1. Select the correct answer and write it in the answer sheet. (10)

1. _____stage of EIA is subsequently after scoping stage
(a) Public participation (b) Final report (c) Preparation of draft (d) Screening

2. _____ family of standards provides practical tools for companies and organizations
(a) ISO (b) ISO 14001 (c) ISO 140011 (d) 140012

3. _____are tools which can quantify an organizational environmental performance and position.
(a) Environmental audits (b) Internal audit (c) cycle assessment (d) ISOLife

4.100,000 ozone molecules can be destructed by_____ chlorine molecules.
(a) One (b) Two (c) Three (d) Four

5. _____ is a not a greenhouse gas
(a) CO (b) N_2O (c) CH_4 (d) CO_2

6._____has control over the affairs of the factory or the premises in relation to any substance
(a) Occupier (b) Safety office (c) Industrial hygienist (d) Auditor

7. _____includes any conduit pipe or channel, open or closed, carrying sewage or trade effluent or any other holding arrangement which causes or is likely to cause, pollution
(a) Inlet (b) Outlet (c) Discharge (d) Influent

8. _____means a place for collection, reception, treatment, storage & disposal of hazardous waste
(a) Transfer station (b) Recycler (c) Incinerator (d) hazardous waste site

9._____helps the world finds pragmatic solutions to our most pressing environment and development challenges.
(a) IUCN (b) GPCB (c) CPCB (d) EPA

10. _____mission is to stop the degradation of the planet's natural environment and build a future in which humans live in harmony with nature
(a)GPCB (b) WWF (c) EPA (d) MINARS

Q.2. Answer the following in brief (Any ten) **(20)**

1. Who does prepare EIA?
2. Write in brief about ISO 14001
3. Comment on different types of environmental audits?
4. What is Green House Effect?
5. What is El Niño and La Niña?
6. What is COP? Briefly write
7. Write a note on power of State Board to obtain information
8. Define : Biodiversity
9. Discuss the responsibilities of an occupier
10. What is GPCB? State its function
11. State the main objectives of MOEF
12. Write a brief note on Silent valley Project.

Q.3.

(a) Explain various stages of EIA process **(06)**
(b) Define the term 'EIA' with its impacts **(04)**

OR

Q.3.

(a) Write a detailed note on Environment Audit **(05)**
(b) Explain in detail Life Cycle Assessment **(05)**

Q4. Discuss Berlin Mandate. **(10)**

OR

Q4. Give a detailed account of Kyoto Protocol **(10)**

Q5.

(a) Write a note on functions of state board under water act, 1974 **(06)**
(b) Discuss functions of central board under water act , 1974 **(04)**

OR

Q5.

(a) Write main objectives of Biodiversity Act, 2002 **(05)**
(b) Write a note on grant of authorisation for handling hazardous wastes and inventory of disposal sites **(05)**

Q.6.

(a) Write a detailed note on CPCB **(05)**
(b) Describe in detail, main objectives of WWF and EPA **(05)**

OR

Q.6. Discuss Chipko movement in detail **(10)**

xxxxxxxxx

(44) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
CLASS---TYBSC SUBJECT: GENETICS (VI SEMESTER)
COURSE: US06CGEN01 Biological Chemistry and Metabolism
Date: 27/3/2017; Monday
Time 10.00am -1.00pm **Total marks-70**

Q1. **MCQs. Attempt all questions.** [10]

i. Vitamin D is derived by the action of UV light from the precursor---
(A) 7-Dehydrocholesterol (B) Lanosterol
(C) Glycocholate (D) Squalene epoxide

ii. Thiamine deficiency leads to:
(A) scurvy (B) beri-beri
(C) night blindness (D) pellagra

iii. Abzyme is a
(A) Zymogen granule (B) Catalytic antibody
(C) Antibiotic (D) Anticancer drug

iv. At saturating levels of substrate the rate of an enzyme catalyzed reaction is
(A) Independent of enzyme concentration
(B) Directly proportional to enzyme concentration
(C) Directly proportional to Substrate concentration
(D) Independent of substrate concentration

v.Fatty acids yield more energy per mole than carbohydrates and proteins. This is because they
(A) Have larger molecular weight
(B) Are more non-polar
(C) Are more reduced
(D) Have more carbon atoms for CO_2 production

vi Ketone bodies are formed by
(A) Breakdown of acetyl CoA produce in excess in β-oxidation pathway
(B) Inhibition of fatty acid activation and transport
(C) Channelization of oxaloacetate from the TCA to gluconeogenesis
(D) Inhibition of cAMP production

vii How many ATP molecules are generated in complete biological oxidation of one molecule of glucose?
(A) 36 ATP (B) 12 ATP
(C) 30 ATP (D) 38 ATP

viii. Given below are the enzymatic reactions of Krebs cycle. In which of the following steps GTP is generated?
(A) Citrate to Isocitrate (B) α-ketoglutarate to Succinyl-CoA
(C) Fumarate to Malate (D) Succinyl-CoA to Succinate

ix.Feedback inhibition of pyrimidine nucleotide synthesis can occur by which of the following ?
(A) Increased activity of Carbamoyl phosphate synthetase
(B) Increased activity of Aspartate transcarbamoylase
(C) CTP allosteric effects
(D) UMP competitive inhibition

x. Which of the following contributes nitrogen atoms to both purine and pyrimidine rings ?
(A) Aspartate (C) Carbamoyl phosphate
(B) Carbon dioxide (D) Glutamate

(P.T.O.)

Q2. **Short questions. Attempt any TEN questions** [20]

a. Enlist the characteristic features of vitamins.
b. Enlist the biochemical functions of vitamin B_7.
c. Give names and classification of all the vitamins.
d. Define zero order and first order reactions.
e. Draw Hanes Woolf plot and Eadie Hofstee plot.
f. Define salvage pathway and denovo pathway.
g. What is transamination and deamination.
h. Enlist the features of saturated fatty acids.
i. Explain the term ketoacidosis.
j. What is the significance of urea cycle?
k. How detoxification of ammonia occurs?
l. Explain activation energy.
m. Enlist the role of PRPP?

Q3. **a.** Enlist the biochemical functions of Vitamin E [06]
b. Explain the structure of vitamin A [04]

OR

Q3 Give the structure, function and deficiency symptoms of ascorbic acid [10]

Q4. **a.** Derive the equation $V = V_{max}[S] / (K_m+[S])$. [06]
b. Explain lock and key theory. [04]

OR

Q4 **a.** Explain the structure and function of ATCase enzyme. [07]
b. Derive the LB equation. [03]

Q5 **a.** Enlist the properties of triacylglycerols. [07]
b. What is ω-oxidation of fatty acids? [03]

OR

Q5. Explain the β-oxidation with energetic of palmitic acid in detail. [10]

Q6. **a.** Describe urea cycle in detail. [07]
b. How ammonia is disposed in different organisms? [03]

OR

Q6. **a.** Discuss slavage pathway of purine and pyrimidine synthesis. [07]
b. Differentiate between transamination and deamination. [03]

— X —

(24A)

Seat No.:_____ No. of Printed Pages: 2

SARDAR PATEL UNIVERSITY

B.Sc. (Genetics) – Sixth Semester Examination (CBCS)

Tuesday, 28th March, 2017

10:00a.m. to 1:00 p.m.

US06CGEN02: Recombinant DNA Technology

Total Marks: 70

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 **Choose the most appropriate answer from the four alternatives given:** **[10]**

i. **Which of the following is true regarding PCR?**
(a) Denaturation involves heating at 90°-98°C
(b) Annealing involves binding of primer between 40°-60° C.
(c) Primer extension occurs at 72°C
(d) All of these

ii. **Reverse transcriptase PCR uses.....**
(a) mRNA as a template to form cDNA (b) RNA as a template to form DNA
(c) DNA as a template to form ssDNA (d) All of these

iii. ***Thermus aquaticus* is the source of .....**
(a) Taq polymerase (b)Vent polymerase (c) Both (a) and (b) (d) Primase enzyme

iv. **Which of the following is not a DNA sequencing method?**
(a) LMPCR (b) Edmans method (c) Sanger's method (d) Maxam-Gilbert method

v. **DNA microarrays are used for.....**
(a) DNA variation screening (b) Gene expression profiling
(c) Microarray comparative genomic hybridization (d) All of the above

vi. **Molecular markers are used to construct.....**
(a) Chromosome maps (b) Physical maps
(c) Cytogenetic maps (d) All of these

vii. **RFLP is used to.....**
(a) Construct high resolution linkage maps (b) Identify single gene disease
(c) Construct QTL maps (d) All of these

viii. **DNA finger printing was developed by.....**
(a) Francis Crick (b) Khorana (c) Alec Jeffrey (d) James Watson

ix. **Which of the following is the substrate for *ribozymes*?**
(a) Proteins. (b) Metal ions. (c) Ribosomes. (d) RNA.

x. **Small Interfering RNAs are capable of**
(a) Being translated. (b) Interfering with transcription.
(c) Leading to the destruction of certain mRNAs. (d) Cutting up other RNAs

(P.T.O.)

Q.2 **Answer any TEN from the following:** [20]

i. Differentiate between multiplex PCR and nested PCR.
ii. What do you mean by primer designing?
iii. Write a short note on principle of PCR.
iv. What is gene sequencing?
v. Write the salient feature of enzymatic DNA sequencing method.
vi. Write the various advantages of gene sequencing.
vii. Define DNA finger printing and its significances in genetics.
viii. What do you mean by non PCR and PCR based method?
ix. What is SNP analysis?
x. Write a short note on gene knockouts.
xi. What is Knock out mice?
xii. What is Dicer?

Q.3 (a) What is PCR? Discuss any two type of PCR studied by you and its advantages. [06]

(b) Write a note on various applications of PCR. [04]

OR

Q.3 (a) Explain in detail about chemical synthesis of oligonucleotides. [06]

(b) Discuss in detail about touch down PCR. [04]

Q.4 (a) Write a detail note enzymatic DNA sequencing method. [05]

(b) Give an account on introduction and applications of microarray technology. [05]

OR

Q.4 (a) Give a detail account on automated DNA sequencing. [06]

(b) Write a note on protein sequencing. [04]

Q.5 (a) What do you mean by molecular markers? Explain in detail about any two PCR based molecular markers studied by you. [10]

OR

Q.5 (a) Give a detail account on molecular genetic approaches in forensic sciences. [05]

(b) Write a note on morphological and biochemical markers with suitable examples. [05]

Q.6 (a) What is site directed mutagenesis? Discuss any one PCR based technique for it. [10]

OR

Q.6 (a) Write a detail note on any one technique of gene silencing with its applications. [05]

(b) Discuss in detail about siRNA technology. [05]

****

SEAT No._____ No. of Printed Pages: 2

(41)

SARDAR PATEL UNIVERSITY

B.Sc. (Genetics) – Sixth Semester Examination (CBCS)

Friday, 31st March 2017

10:00 a.m. to 1:00 p.m.

US06CGEN03: Principles of Genetics and Breeding

Total Marks: 70

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 **Choose the most appropriate answer from the four alternatives given:** **[10]**

i. **Objectives of plant breeding are_____.**
(a) high yield (b) improved quality (c) avoid dormancy (d) all of them

ii. **First Agricultural University established at Pantnagar, _____.**
(a) Uttar Pradesh (b) Gujarat (c) Madya Pradesh (d) Panjab

iii. **Gene pool consist of _____.**
(a) modern cultivars (b) advanced breeding material
(c) land races (d) all of the above

iv. **The new varieties of plants are produced by _____.**
(a) introduction and mutation (b) selection and hybridization
(c) mutation and selection (d) selection and introduction

v. **Self pollinated species are also known as_____ species or inbreds.**
(a) allogamous (b) cleistogamy (c) chasmogamy (d) autogamous

vi. **Which of the following would cause deviation from the Hardy-Weinberg equilibrium ?**
(a) small population (b) no migration (c) random mating (d) no mutation

vii. **Total of gene and genotype frequency is _____.**
(a) 1 (b) 100%
(a) both (a) and (b) (d) none of the above

viii. **Change in frequency of allele in a population due to random sampling of organisms is.**
(a) gene expression (b) gene linkage (c) genetic drift (d) gene mutation

ix. **Example of Co-dominant is marker _____.**
(a) SCAR (b) RFLP (c) both (a) and (b) (d) none of them

x. **A molecular marker which is decided by conformational change in ss DNA is**
(a) RFLP (b) VNTR (c) SSCP (d) SNP

(P.T.O.)

Q.2 **Answer any TEN from the following:** [20]

i. What do you mean by plant breeding as a technology?
ii. Write a short note on: secondary and tertiary gene pool.
iii. Enlist different objectives of plant breeding.
iv. Define purelines and clones.
v. What do you mean by seed purity classes?
vi. Write a short note on inbreeding depression.
vii. What is genetic drift?
viii. How migration changes gene frequency?
ix. Define random mating and allele frequency.
x. Write a short note on SSCP.
xi. What do you mean by NIL ? Mention its applications.
xii. What is SCAR? Write the advantages of SCAR.

Q.3 **(a)** Discuss in detail about the conservation of germplasms. [06]

(b) Give a detail account on: ICAR and IARI. [04]

OR

Q.3 **(a)** Write a note on major activities and opportunities of plant breeding technology in crop improvements. [06]

(b) What do you mean by domestication and acclimatization of germplasms? [04]

Q.4 **(a)** Discuss about classes of the seed [06]

(b) Give a detail account on mutation breeding. [04]

OR

Q.4 **(a)** Discuss in detail about various methods of plant breeding. [06]

(b) Write a short note on seed certification and multiplication. [04]

Q.5 **(a)** Explain in detail about migration and selection affecting changes in allele and genotype frequencies. [10]

OR

Q.5 **(a)** Write a detail note on Hardy Weinberg law in population genetics. [10]

Q.6 **(a)** Explain various molecular markers used in marker assisted selection program (any three). [10]

OR

Q.6 **(a)** Write a detail note on NIL and BSA. [07]

(b) Write a brief note on types of markers used in plant breeding. [03]

****

SEAT No._____ No. of Printed Pages : 2

[41]

SARDAR PATEL UNIVERSITY APR-2017 EXAMINATION

DATE -03/04/17 DAY- MONDAY TIME 10:00 TO 1:00 pm

Course- US06CGEN04 SUBJECT: GENETICS

CLASS- T.Y.B.Sc - VI Sem TITLE-Bioinformatics

TOTAL MARKS: 70

Q1- Answer the following Multiple Choice Questions: [10]

1)Which one of the following is a primary protein database?
a) SWISS-PROT b) EMBL c) DDBJ d) NCBI.

2) The brain of any computer system is
a) ALU b) Memory c) CPU d) Control unit

3) In PowerPoint, each page is called
a) A worksheet b) A text page c) A slide d) A presentation

4) Entrez, a life science search engine used to search across databases is maintained by _____.
a) SWISS-PROT. b) EMBL c) DDBJ d) NCBI.

5) The alignment search uses only conserved region in the sequences
a)Local alignment b) Global alignment
c)Pairwise alignment d) Multiple alignment

6) Introns are encoded by conserved region at 5' and 3' end are
a)GT-AU b) AG-GT c) GT- AG d) CG-GC

7)_____ compares protein sequence against protein databases.
a) BLASTp b) BLASTn c) BLASTx d) tBLASTx..

8) ORF is
a) open reading frame b) open research form. c) online research form d) none

9) Sulphur containing amino acids are
a) Cysteine and methionine b) Methionine and threonine c) Cysteine and threonine
d) Cysteine and serine

10) Secondary database is
a)Data collected from scientist b) modified data of primary database
c)Data collected from public d) none

Q2- ANSWER IN BRIEF (Attempt any 10) (each carry 2 marks) [12]

1) Differentiate between RAM & ROM.
2) Give the importance of Internet in Bioinformatics.
3) Enlist any 4 databases that contain sequence information.
4) Discuss the importance of biological databases in biology.
5) Differentiate local & global alignment.

(PTO)

6) Enlist any 5 useful sites of Bioinformatics.
7) What is Unix Operating system.
8) Explain tertiary structure of protein.
9) Diagrammatically explain the structure of Eukaryotic gene.
10) Enlist any 6 databases of NCBI.
11) How PubMed central differ from PubMed?
12) Give the basic concept of Chou Fasman mehod.

Q3-a) Explain structural organization of computer diagrammatically. [05]
Q3- a) Discuss different generations of computer. [05]

OR

Q3 - Elaborate in detail MS-OFFICE software and its different applications. [10]

Q4- What are databases? Classify it with examples. [10]

OR

Q4- a) Clarify the concept, scope & applications of Bioinformatics. [05]
Q4- b) Simplify NCBI data model and its various databases. [05]

Q5- Explain phylogenetics analysis and tool related to it. [10]

OR

Q5- a) Describe BLAST ,its type & importance. [05]
Q5- b) Explain Shareware software & how it is differ from freeware software. [05]

Q6- What is gene prediction? Elaborate any two methods in detail. [10]

OR

Q6- What is structure prediction? Elaborate any two methods in detail. [10]

—X—

No. of Printed Pages : 2

SEAT No._____

[17A]

Sardar Patel University

Ty B.Sc. Sixth Semester examination-2017

Subject-Genetics **Date: 08/04/2017**

Course-US06CGEN05:Animal Biotechnology

Time :10am to 1pm **Total Marks-70**

Q1 **Multiple Choice Questions (one mark each). Attempt all** [10]

1 Report of First Artificial insemination in India at Mysore was in

A)1939 B) 1998 C) 1987 D) 1949

2 Superovulation is done in ____animal

A)Donor B) Recipient C) Both A and B D) None of above

3 _____pronucleus is large in size in zygote

A) Female B) Male C) Both A and B D) None of above

4 Enzymes used in tissue disaggregation are ----------

A) Trypsin B) Collagenase C) Both A and B D) DNAse

5 Full form of RPMI is _____ memorial Institute

A) Rosewell park B) Roselin Park C) Roman Park D) None of above

6 Substrate is required by cells in _____

A)Cell line B) Primary cell culture C) Both A and B D) All of above

7 _____ which help cells to attach with substrate in animal cell culture

A)Transferrin B) Fibronectin C) Albumin D) All of above

8 Ovulation takes place in cow after___ of onset of estrus

A) 1hr B) 14days C) 14hrs D) 48days

9 _____ phase is absent in initial mitosis in embryonic development

A)G1 B) G2 C) Both A and B D) S

10 In transgenic sheep Genes transferred for quality wool was

A)Met E and Met M B)Cys E and Cys M C) Both a and b D) None of above

Q2 **Short questions : attempt any ten** [20]

1 Give history of animal cell cultures

2 Write about transgenic mice

3 Enlist advantages of ETT.

4 Define superovulation and synchronization

5 Write applications of animal cell culture

C 1)

(PTO)

6 What is skin regeneration?

7 Write about in vitro fertilization

8 Define transformation and transfection

9 Give brief about Selection of recipient

10 Write advantages of cryopreservation of animal germ plasm

11 Write about Cell viability and Toxicity

12 Enlist different types of medium for animal cell culture

Q.3 a. Discuss enzymatic disaggregation for animal tissue culture [05]

b. Give advantages and disadvantages of serum free media [05]

OR

Q.3 a Discuss evolution of cell line in animal cell culture [05]

b Give advantages and disadvantages of serum containing media [05]

Q.4 Write a detail note on artificial insemination with importance and limitations [10]

OR

Q.4 a. Discuss grading of embryos and its cryopreservation [06]

b. Give brief account of mammalian embryonic development. [04]

Q.5 Explain in detail Superovulation and Synchronization of estrus in animals [10]

OR

Q.5 a. Discuss embryo collection and Transfer in recipients. [7]

b. Write a brief note on hormones used for ETT programme [3]

Q.6 Discuss any four methods of transfection [10]

OR

Q.6 Discuss about transgenic animals- Sheep, Pigs, Goats, and Cows [10]

****ALL THE BEST ****

SEAT No._____ No. of Printed Pages: 2

(26)

SARDAR PATEL UNIVERSITY

B.Sc. (Genetics) – Sixth Semester Examination (CBCS)

Friday, 07th April, 2017

10:00 a.m. to 1:00 p.m.

US06CGEN06: Biomedical Genetics

Total Marks: 70

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 **Choose the most appropriate answer from the four alternatives given:** **[10]**

i. **Current treatment for cancer does not include :**

(a) Chemotherapy (b) Radiotherapy

(c) Surgery (d) Physiotherapy

ii. **A cancer located in connective tissue is called:**

(a) Carcinoma (b) Sarcoma (c) Lymphoma (d) Leukemia

iii. **Which of the following component are essential for PCR.**

(a) Primer (b) DNA template (c) Taq-DNA polymerase (d) All of them

iv. **Heteroduplex analysis involves:**

(a) Denaturation (b) Fragmentation (c) Solublisation (d) None of these

v. **Test performed to know the mutagenic nature of a substance is called:**

(a) Ames Test (b) Biuret Test (c) ELISA (d) None of these

vi. **Candidate gene is likely to be a disease-associated gene if:**

(a) Loss-of-function mutation causes the phenotype

(b) It is a pseudogene

(c) Multiple different mutations cause the phenotype

(d) The pattern of expression of the gene is inconsistent with the phenotype

vii. **Germ-line therapy is:**

(a) Heritable (b) Not heritable (c) Sometimes heritable (d) Unrelated to heritability

viii. **Which cell type would not be a direct target for gene therapy?**

(a) Red blood (b) Muscle (c) Liver (d) Endothelium

ix. **Which of these stem cells are totipotent?**

(a) Dental (b) Amniotic (c) Cord cells (d) Embryonic

x. **_____ deficiency was the first disorder which researchers treated with gene therapy.**

(a) ADA (b) OTC (c) HH (d) DMD

P.T.O

Q.2 **Answer any TEN from the following:** **[20]**

i. Define cancer and mutations.
ii. What is the principle of SSCP?
iii. Enumerate various mechanisms of malignant transformation.
iv. What is the significance of sequencing in detection of mutations?
v. Define malign and benign tumors and give comparative account on them.
vi. What do you mean by PTA and DGGE?
vii. What do you mean by genetic mapping?
viii. Define candidate gene and its importance.
ix. Define chromosomal anomalies and methods to identify them.
x. Enumerate various strategies to manage genetic disease/disorders.
xi. Briefly mention various types of stem cells.
xii. Define genetic counseling and its significance.

Q.3 **(a)** What is chemotherapy? Explain in detail about various chemotherapeutic drugs studied by you. **[10]**

OR

Q.3 **(a)** Write a note on Proto-oncogenes and their classes with example. **[05]**

(b) Mention major differences between healthy and cancerous cells. **[05]**

Q.4 **(a)** Mention comparative account of positional and functional cloning. **[05]**

(b) Explain positional cloning in brief. **[05]**

OR

Q.4 **(a)** Give an account on physical mapping. **[05]**

(b) Explain in detail about candidate gene approach with suitable examples. **[05]**

Q.5 **(a)** Enumerate various strategies for detection of mutation or mutant gene. Explain any one in detail with diagram. **[10]**

OR

Q.5 **(a)** Briefly explain about heteroduplex analysis and its significance. **[05]**

(b) Write a detail note on multiplex PCR and its advantages. **[05]**

Q.6 **(a)** What is Genetic Counseling? Mention situations where it shows very significant. **[05]**

(b) Briefly explain about gene therapy and its types. **[05]**

OR

Q.6 **(a)** Enumerate various strategies to manage genetic disease/disorders. **[05]**

(b) What are the various applications of Stem cells? **[05]**

****

(45 & A-23) Seat No. ... Pages : 2

Sardar Patel University

B. Sc. (Semester – VI) Examination

Date: 27th March 2017, Monday Time: 10:00am to 01:00pm

Industrial Chemistry

COURSE NO: US06CICH01 (SYNTHETIC DYES AND INTERMEDIATES)

Notes: Figures to the right indicate full marks. Total marks: 70

Q.1 Answer the following Multiple Choice Questions. (All are compulsory) (10)

1. Dye bath defined is.....
   A. It is the bath which contains the dye and other chemicals used in dyeing process.
   B. It is a bath for crystallization of the dye.
   C. It is a bath for washing the Fibre.
   D. All of them
2. -NH2, -OH, -NHR, -NR2 are.....
   A. Chromophores.
   B. Auxochromes.
   C. Electron accepting groups.
   D. All of them.
3. -NO2, -NO, -N=N- groups are also known as.....
   A. Auxochromes.
   B. Chromophores.
   C. Electron releasing groups.
   D. None of them.
4. Congo red dye is prepared by coupling tetraazotizedbenzidine with 2 molecules of:
   A. Alph-Naphthyl amine-4-sulphonic acid.
   B. Beta-Naphthyl amine-4-sulphonic acid.
   C. Phenol-4-sulphonic acid.
   D. None of them.
5. The stability of diazonium salt decrease by inserting of.....
   A. Electron releasing groups in the benzene ring.
   B. Electron accepting groups in the benzene ring.
   C. Neutral groups in the benzene ring.
   D. All of them.
6. Acid dyes are.....
   A. The sodium salts of sulphonic and carboxylic acids
   B. Water insoluble cationic dyes.
   C. All Azo-dyes.
   D. All of them.
7. The oldest known dye is.....
   A. Indigotin dye.
   B. Congo red dye.
   C. Phenolphthaleine dye.
   D. None of them.
8. Indigotin dye have.....
   A. A deep red color.
   B. A deep blue color.
   C. Orange color
   D. None of them.
9. Estimation of Azo dye involved ..... reaction.
   A. Reduction reaction
   B. Oxidation reaction
   C. Redox reaction
   D. None of these
10. Estimation of Sulfanilic acid is carried out by .....
    A. Direct method
    B. Indirect method
    C. Special method
    D. None of them.

(P.T.O.)

Q-2 Answer the following short question (Any TEN) (20)

1. Define term "Complementary colors".
2. Enlist different examples of "Dependent chromophores".
3. What is Bathochromic effect?
4. What mean by "A→M→E" type azo dyes.
5. Indicate medium and position of coupling in "J-acid".
6. Write a structure of "Chromotropic acid".
7. Give synthesis of "Disperse Orange-1".
8. Give the difference between reactive and direct dyes.
9. Write reaction for estimation of $-NO_2$ group.
10. Define term "Nitrite value".
11. What mean by "Iodiemitry titration".

Q-3 Explain the following statements. (10)

A. *p*-nitro phenol is colourless but it is yellow in alkaline solution.
B. If one of the two amino groups of Doebner's violet is replaced by a hydrogen atom, the resulting compound *p*-aminotriphenylmethane is almost colourless.

OR

Q-3 Write a detail classification of dyes according to their Method Of Applications. (10)

Q-4 Write a notes on following: (10)

A. Lapworth's notation for AZO dyes.
B. Discuss the Indirect method of diazotization.

OR

Q-4 Write a notes on following: (10)

A. Classification of Azo dyes.
B. Stabilization of diazo compound for a coupling reaction.

Q-5 Write a notes on application method of Disperse dyes & Vat dyes. (10)

OR

Q-5 Enlist various classes of Reactive dyes giving suitable examples. (10)

Q-6 Write a notes on following: (10)

A. Procedure to determination of Beta Naphthol.
B. Method for determination of amines.

OR

Q-6 Write a notes on following: (10)

A. Estimation of H-Acid.
B. Reactions for the estimation of Chloride, Azo and Nitroso groups.

— X —

(25A&A-23)

Seat No: _____ No of Printed Pages : 2

Sardar Patel University

B. Sc. (Semester – VI) Examination

Date: 28th March 2017, Tuesday Time: 10:00 am to 01:00pm

Industrial Chemistry

COURSE NO: US06CICH02 (PHARMACEUTICALS)

Notes: Figures to the right indicate full marks. Total marks: 70

==========

Q.1 Answer the following Multiple Choice Questions. (All are compulsory) (10)

1. Formaldehyde is used by _____.
   A. Taxidermist
   B. Psychitrite
   C. Economist
   D. Nome of them
2. A low form of vegetable life is _____.
   A. Fungi
   B. Bacteria
   C. Virus
   D. Antimetabolies.
3. Paul ehrlich discover _____.
   A. Magic bullet
   B. Magic train
   C. Bullet
   D. Chemotheraputic agent
4. Soluble aspirin is known as _____.
   A. Dispirin.
   B. Aspirin-A
   C. Aspirin-S
   D. Dispirin-S
5. _____ drug is used under strict supervision of a doctor.
   A. Analgin
   B. Phenyl butazone
   C. Paracetamol
   D. Phenacetene.
6. Which one is used as an anti-fungal agent?
   A. Benadryl
   B. Sulfa drug.
   C. Acetic acid.
   D. Caprylic acid.
7. Which of the following hormone is secreted in Pancreas?
   A. Thyroid
   B. Ovaries
   C. Testes
   D. Insulin
8. Which of the following hormone is secreted in Duodenal?
   A. Insulin
   B. Ovaries.
   C. Adrenaline.
   D. Enterogasterone.
9. A substance used to provide nutrients for the growth and multiplication of organisms is known as:
   A. Culture
   B. Inoculum
   C. Agar.
   D. Medium
10. Which of the following is destroy the ferment and retard the fermentation reaction?
    A. Additives
    B. Culture
    C. Agar
    D. Preservatives.

(P.T.O.)

Q.2 Answer the following short questions. (ANY TEN) (20)

1. Define term "Drug addiction".
2. Explain a term "Pharmacology".
3. Giving example, enlighten term "Pro-drug".
4. Give an example of N^1 substituted Sulpha drug.
5. Give any two examples of "Anti-inflammatory drugs".
6. Define term Narcotics drugs.
7. Define term "Hormones".
8. Give properties and structure of Vitamin-A1.
9. Explain the term "Antibiotic".
10. Define term "Sterilization".
11. Enlist factors affecting the fermentation process.
12. What mean by "Anaerobic Microorganisms".

Q.3 Give detailed classification of drug on the basis of their therapeutic actions. (10)

OR

Q.3

A. Explain effect of alkyl group when it substitutes active hydrogen in drug. (05)
B. Write note on "Chemotherapeutic agents". (05)

Q.4 Write classification, properties and uses of Sulfa drug. (10)

OR

Q.4

A. Write a note on Anti-inflammatory drug. (06)
B. Discuss mode of action of antipyretic drugs. (04)

Q.5 Give classification of vitamins and discuss about the Vitamin-C and B-complex. (10)

OR

Q.5 Give detail note on Hormones and its classification. (10)

Q.6 Write a notes on following: (10)

A. Culture development and Inoculums.
B. Chemical elements as nutrients for microorganism.

OR

Q.6 Write a notes on following: (10)

A. Toxic effects on culture.
B. Manufacture, properties and uses of "Ethanol" by fermentation process.

(42 & A-23) SEAT No._____ No. of Printed Pages : 2

Sardar Patel University
B.Sc. (Sixth Semester) Examination
31st March 2017, Friday
Subject code: US06CICH03 (Polymer Technology)
Industrial Chemistry

Time: 10:00 am to 1:00 pm **Total Marks: 70**

Q-1 Answer the following MCQ'S: **(10)**

I. Cellulose is known as _____ polymer
a. Semi-synthetic b. Natural c. Synthetic d. Plastic

II. Polymerization in which two or more chemically different monomers take part is called_____
a. Co-polymerization b.Addition polymerizationc.Ring opening d. Step polymerization

III. Peroxide is generally used as_____
a. Initiators b. Inhibitors c. Prometer d. All of these

IV. Reaction between phenol and formalin produced_____
a. MF-resin b.PF-resin c. UF- resin d. Polyurethane

V. Functionality of Melamine is _____
a. Two b. Three c.One d.Six

VI. The reaction between urea and formaldehyde gives_____
a. Polyurethane b. Epoxy c.Nylon d.Urea formaldehyde

VII. The low density polyethylene prepared at _____pressure process.
a. High b. Low c. Random d. Constant

VIII. Fawcett and Gibson were synthesized _____ in 1933.
a. Ethylene b. Polyethylene c. Propylene d. Polypropylene

IX. Nylon are _____
a. Polyamide b.Polyurethane c. Epoxy d. None of these

X. _____ is the homopolymer of caprolactum.
a. Nylon 6 b. Nylon 6,6 c. Saran d. Orlon

Q-2 Answer the following short question (AnyTen) **(20)**

I. Define: Polymer &Repeating unit.
II. Give the name of methods and techniques of polymerization.
III. Define: Elastomer and Plastomer.
IV. What are polyols? Give types of polyol.
V. How phenol is syntheised?
VI. Give applications of Phenol formaldehyde.
VII. Give the name of different polyethylene and also their density range.
VIII. Enlist the various methods for polyethylene synthesis.
IX. Write brief about high density polyethylene (HDPE).
X. Write the different Grades of Nylon.
XI. Write the reaction for nylon-6,6 synthesis.
XII. Give the example of five natural fiber.

(P.T.O.)

Q-3 a. Write detail note on Zeigler-Natta catalyst. (05)

b. Give the classification of polymer based on thermal responses&tacticity. (05)

OR

Q-3 a.Write a short note on Initiators and Inhibitors. (05)

b. Explain Bulk polymerization &solution polymerization techniques. (05)

Q-4 a.Explain the process of manufacturing phenol formaldehyde Novalac resin. (05)

b.Describe the process of manufacturing polyurethane. (05)

OR

Q-4 a.Describe the process of manufacturing melamine formaldehyde resin. (05)

b.Write important properties and application of Urea formaldehyde resin. (05)

Q-5 a. Described the manufacturing process polyethylene. (05)

b.Explain the manufacturing of polystyrene. (05)

OR

Q-5 a.Write a note on PTFE. (05)

b.Explain the manufacturing of polypropylene by slurry process. (05)

Q-6 Write a note on Styrene butadiene rubber. (10)

OR

Q-6 With suitable flow diagram explain the manufacturing of nylon-6,6. (10)

— X —

SEAT No._____ No. of Printed Pages : 2

[428A22]

SARDAR PATEL UNIVERSITY

(VI Sem)T.Y.B.Sc. EXAMINATION

MARCH-2017

INDUSTRIAL CHEMISTRY

US06CICH04

Management, Costing & Plant Design

DATE : 03/04/2017 **TIME : 10.00.to.1.00**

QUE-1 Choose the most appropriate option for the following **10**

1 The tax levied from only major corporation by central government is_____
(a) Surplus tax (b) normal tax
(c) capital gain tax (d) both a & b

2 The period during which the use of property is economically feasible is known as
(a) Property life (b) service life
(c) both a & b (d) economy life

3 _____% of capital investment of an annual insurance cost for ordinary industrial return.
(a) 1 (b) 5 (c) 8 (d) 10

4 The measurement of amount of profit that can be obtained from given situation is called
(a) Profitability (b) net profit assumption
(c) excess profit (d) break even analysis

5 The formula for selling price is
(a) S=F+V+P (b) F=S+V+P
(c) V=F+S+P (d) all of these

6 The formula which shows the value of product is
(a) Benefit/cost (b) cost/benefit
(c) benefit – cost (d) cost-benefit

7 The unit of toxicity is expressed in _____
(a) LD_{50} (b) SD_{50} (c) CD_{50} (d) DD_{50}

8 The stock kept to meet unanticipated increase in usage is called
(a) Usage stock (b) safety stock
(c) emergency stock (d) Non emergency stock

9 Which of the following is the method for planning lay out?
(a) Unit area concept (b) Two dimensional
(c) Both a and b (d) None

10 Identify the factor on which final selection is done
(a) Initial cost (b) Maintenance
(c) Probable life (d) All of these

QUE-2 Answer the following in very short (Any Ten) **20**

1 Define: Salvage value, Book value.
2 Define: Market value, Replacement value.
3 What do you mean by ordinary simple interest and exact simple interest?
4 Define marketing mix and which are the pillars of marketing?
5 Explain the tasks of marketing management.
6 Define: Wants, Demands.
7 Define: Reorder point, Safety stock
8 Enlist various factors involved in project cost estimation.
9 Enlist the primary factors considered in plant location.
10 Explain pilot plant study.
11 Explain lethal dose giving suitable example.
12 What points are taken in to consideration while designing a commercial unit?

(PTO)

QUE-3	**Attempt the following**	
[A]	Enlist different methods for calculating depreciation and explain any two in brief.	**[05]**
[B]	Enlist different methods for calculating interest and explain them in brief.	**[05]**
	OR	
QUE-3	**Attempt the following**	
[A]	Write a short note on taxes.	**[05]**
[B]	Define financial management and give the sources of finance for long term business purpose.	**[05]**
QUE-4	**Attempt the following**	
[A]	Explain various stages of demand and the corresponding marketing task.	**[05]**
[B]	Discuss the core concept of marketing.	**[05]**
	OR	
QUE-4	**Attempt the following**	
[A]	Discuss the marketing pricing policy.	**[05]**
[B]	Explain various concept of marketing.	**[05]**
QUE-5	Discuss needs and objectives of inventory management. Discuss carrying cost and ordering cost.	**[10]**
	OR	
QUE-5	Write a note on ABC analysis of inventory management. Also explain different methods for EOQ calculation.	**[10]**
QUE-6	**Attempt the following**	
[A]	Write a note on selection of material	**[05]**
[B]	Discuss principle of plant lay out.	**[05]**
	OR	
QUE-6	**Attempt the following**	
[A]	Write a note on commercial plant.	**[05]**
[B]	Write a note on logical evolution of process.	**[05]**

– X –

SEAT No._____ No of Printed Pages : 2

[18A]

Sardar Patel University

T.Y. B.Sc. Industrial Chemistry, Semester-VI

US06CICH05

Industrial Instrumentation and Process Control

Date: 8th April 2017

Time: 10:00 am to 01:00 pm **Total Marks: 70**

Q – 1Answer the following multiple choice questions. **[10]**

1.Invar is used as-------- in bimetallic thermometer.

a. low expansion metal b. high expansion metal

c. deflector d. None of these

2. Liquid expansion thermometer uses----- of liquid

a. Volumetric expansion b. Temperature expansion

c. Both a and b d. None of these

3. ------- characteristic are considered when instrument is used to measure quantity or condition varyingwith time.

a. Static b. Dynamic

c. Both d. None

4. Which is the unit of pressure.

a. N/m^3 b. Pascal

b. Micron d. All of these

5. U – tube monometer is used for measurement of _____.

a. Temperature b. pressure

c. heat capacity c. All of these

6. Level is measured using _____method

a. Newton b. Bob and tape

c. Bernoulli d. All of these

7. Theoretical velocity of pitot tube is _____.

a. √2gh b. 2gh

c. 3gh d. 4gh

8. Orificemeter is a _____.

a. differential area meter b. differential head meter

c. Both a & b d. None of these

9. Amplifiers are used for increasing _____.

a. strength of signal b. length of signal

c. Transmission of signal d. None of them

10. -------- signals are relayed as a series of values that a device can read

a. Analog b. Digital

c. Both d. none

(P TO)

Q-2 Answer any three of the following: (Any Ten) **[20]**

1. Name different temperature scales used in practice with suitable symbol.
2. Write principle of thermocouple.
3. Explain direct and indirect measurement.
4. List the different units of pressure.
5. Write the principle of diaphragm pressure gauge.
6. Write classification of level measuring instrument.
7. Explain classification of orifice plate,
8. Write equation for velocity of Venturimeter and orifice meter.
9. Write the principle of orificemeter.
10. List the different device used for producing records.
11. Define hunting of valve.
12. What do you mean by ON-OFF control?

Q – 3 a. Write a note on principle,working and advantages of thermistor. **[05]**

b. Explain working of optical pyrometer **[05]**

OR

Q – 3 a. Discuss mercury in glass thermometer. **[05]**

b.Explain classificationand working principle of thermocouple. **[05]**

Q – 4 a. Explain dead weight potstone gauge. **[05]**

b. Write a note on sight glass level measuring method. **[05]**

OR

Q – 4 a. Discuss in brief bourdon tube pressure gauge. **[05]**

b. Explain working of Pirani gauge. **[05]**

Q – 5 a. Derive an equation for Triangular notch. **[05]**

b.Write the principle, construction, working and advantages of Orificemeter. **[05]**

OR

Q – 5 a. Write the principle, construction, working and advantages of Venturimeter. **[05]**

b. Write classification of flow measuring device for closed channel and open channel flow. **[05]**

Q – 6 Write classification of graphic recorder and discuss any one in brief. **[10]**

OR

Q – 6 Explain in detail, **[10]**

i. analog and digital type indicator.

ii. circular and strip chart recorder.

— X —

SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

[278A21] B.Sc. Industrial Chemistry SEMESTER – VI EXAMINATION –April 2017

Mass Transfer Operations

SUB CODE: US06CICH06

DATE: 7TH April 2017

TIME: 10:00 am to 1:00 pm

TOTAL MARKS: 70

Q. 1 Choose the correct answer. [10]

(1) _____ is the temperature at which a liquid mixture of given composition start to vaporize as temperature increases
(a) Bubble point (b) Dew point (c) Feed point (d) None of these

(2) Distillation is used for separating_____.
(a) L-L mixture (b) L-G mixture (c) L-S mixture (d) G-G mixture

(3) Which out of the following is the most volatile component.
(a) One with boiling point 40^0C (b) One with boiling point 50^0C
(c) One with boiling point 90^0C (d) One with boiling point 100^0C

(4) For ceramic products, _____ dryer is used.
(a)Tunnel (b) Spray (c) Tray (d) None of these

(5) Function of flight design in the inside wall of rotary dryer is _____.
(a)To lift the solids (b) To break the lumps of solids
(c) To move in forward direction (d) None of these

(6) Drying operation involves the transfer of solute material from _____ phase to gas.
(a)Liquid (b) Solid (c) Gas (d) None of these

(7) In Krystal crystallizer, supersaturation is achieved by _____.
(a)Evaporation (b) Cooling (c) Adiabatic evaporation (d) distillation

(8) In gas absorption packing size should not be more than 1/8th of column _____.
(a) Length (b) Height (c) Diameter (d) None of these

(9) Solubility is expressed as parts by weight solute per _____ parts by weight solvent.
(A)50 (b) 100 (c) 110 (d) 10

(10) Liquid extraction involves separation of liquid mixture by using_____.
(a) Insoluble solvent (b) Solute (c) Volatility (d) Boiling point

Q.2 Answer the following.(attempt ten) **[20]**

(1) Define optimum Relux Ratio
(2) Enlist the limitation of Mc Cabe Thiel method.
(3) Define Relative Volatility
(4) Distinguish between evaporation and drying
(5) Define equilibrium moisture and critical moisture content.
(6) Distinguish between adiabatic dryer and non-adiabatic dryer
(7) Define saturation and super saturation.
(8) State the situations in which the packed columns are well suited
(9) Define channeling in packed columns

(10) Differentiate between extract and raffinate
(11) What are the important characteristics of tower packing?
(12) Differentiate between leaching and liquid extraction

Q.3 With the help of neat sketches, explain the principle of flash distillation and simple distillation [10]

OR

Q.3 Derive the expression of minimum reflux ratio for distillation [10]

Q.4 (A) Explain the construction and working of tray drier. [05]
(B) Explain the construction and working of tunnel drier. [05]

OR

Q.4 (A) Explain the construction and working of drum drier [05]
(B) Explain the construction and working of spray drier [05]

Q.5 (A) Write the construction and functioning of packed column used for gas absorption [05]
(B) What factors should be considered while selecting solvent for gas absorption? [05]

OR

Q. 5 (A) Write a note on mechanically agitated vessels used for gas absorption [05]
(B) Explain the construction and working of Swenson-walker crystallizer with suitable diagram [05]

Q. 6 (A) Explain the working of Basket extractor with suitable diagram [05]
(B) Explain the various factors influencing the rate of extraction in leaching [05]

OR

Q. 6 (A) Explain in briefly the selection criteria for solvent to be used for liquid-liquid extraction [05]
(B) With the help of a neat sketch ,explain the working of spray column used for liquid-liquid extraction [05]

— X —

(46 & A-22) Seat No.:_____ No. of Printed Pages : 2

Sardar Patel University

B. Sc. (Semester – VI) Examination

Date: 27th March 2017, Monday Time: 10:00am to 01:00pm

Industrial Chemistry Vocational

COURSE NO: US06CICV01 (DYES & INTERMEDIATES)

Notes: Figures to the right indicate full marks. Total marks: 70

Q.1 Answer the following Multiple Choice Questions. (All are compulsory) (10)

1. Acid dyes are suitable for the fibres having.....groups.
   A. Basic
   B. Acidic
   C. Neutral
   D. Aromatic
2. Picric acid is of.....type dye class.
   A. Acid
   B. Basic
   C. Direct
   D. Mordant dye
3. -NO2, -NO, -N=N- groups are also known as.....
   A. Auxochromes.
   B. Chromophores.
   C. Electron releasing groups.
   D. None of them.
4. Congo red dye is prepared by coupling tetrazotizedbenzidinewith 2 molecules of:
   A. Alph-Naphthyl amine-4-sulphonic acid.
   B. Beta-Naphthyl amine-4-sulphonic acid.
   C. Phenol-4-sulphonic acid.
   D. None of them.
5. In lapworts notation "Z" represents.....
   A. Coupling component having two coupling position
   B. The middle component
   C. Coupling component having three coupling position
   D. None of them.
6. .....is the most widely used metal in Mordent-Azo dye.
   A. Chromium
   B. Berium
   C. Chloride
   D. Aluminium
7. The oldest known dye is.....
   A. Indigotin dye.
   B. Congo red dye.
   C. Phenolphthaleine dye.
   D. None of them.
8. Indigotin dye have.....
   A. A deep red color.
   B. A deep blue color.
   C. Orange color
   D. None of them.
9. Poly-hydroxyl napthalene is determined in exactly the same way.....
   A. Alpha-naphthol
   B. Beta-naphthol
   C. Alpha-naphylamine
   D. Beta-naphylamine
10. Titanium trichloride is on oxidation, it is converted to the colorless
    A. Ti(OH)4
    B. TI(COOH)4
    C. TI(Cl)4
    D. TIO2.

(P.T.O.)

Q-2 Answer the following short question (Any TEN) (20)

1. Enlist various requirements of colouring substances to be a dye.
2. Define terms Bathochromic Auxochrome and Hypsochromic Auxochrome.
3. Define term "Complementary colors".
4. Explain "A→M→E" type azo dyes.
5. Indicate medium and position of coupling in "J-acid".
6. Give a structure of "Chromotropic acid".
7. Differentiate terms Reactive dye and Acid dye.
8. Write properties Disperse dye.
9. State the advantages offered by Reactive dye over Pigment.
10. Write reaction for estimation of -NO group.
11. Define term "Coupling value".
12. What mean by "Iodiemitry titration".

Q-3 Give the classification of DEYS according to their mode of applications. (10)

OR

Q-3 Giving suitable examples, explain different postulates of Valance Bond Theory. (10)

Q-4 Write a notes on following: (10)

A. Give classification of AZO dyes on the basis of number of AZO groups.
B. Discuss the Direct method of diazotization in detail.

OR

Q-4 Write a notes on Stabilization of diazo compound for a coupling reaction and also discuss the factors effecting to it. (10)

Q-5 Give detail note Disperse dyes mode of applications and classification. (10)

OR

Q-5 Enlist various classes of Reactive dyes giving suitable examples. (10)

Q-6

A. Discuss the procedure for preparation of 0.1N Sulfanilic acid solution. (05)
B. Write a note on "procedure for alpha Naphthol estimation. (05)

OR

Q-6

A. Write a note on "Estimation of H-Acid". (05)
B. Give an account of light fastness of dyes. (05)

— X —

(26A & A-22) Seat No.:_____ No. of printed pages: 02

SARDAR PATEL UNIVERSITY

Examination: T.Y.B.Sc. Industrial Chemistry (Vocational), Semester: VIth

Day: Tuesday **Date:** 28/03/2017

Session: Morning/ ~~Evening~~ **Time:** 10:00am to 01:00pm

Subject/ Course Code: US06CICV02

Subject/ Course Title: Heavy and Fine Organic Chemicals

TOTAL MARKS: 70

Q.1 Choose the correct answer. **[10]**

(1) Vapour phase reaction between acetylene and acetic acid in the presence of a _____ catalyst yields vinyl acetate.
(A) Mercuric chloride (C) Zinc acetate
(B) Charcoal (D) Raney-nickel

(2) Propagyl alcohol reacts with aldehyde or vinyl ethers in the presence of an acid catalyst to from _____.
(A) Ketones (C) Acid chlorides
(B) Acetals (D) Carboxylic acids

(3) Partial oxidation of natural gas produces _____.
(A) Acetone (C) Acetylene
(B) Methane (D) None of these

(4) Catalytic vapour-phase oxidation of methanol produces _____.
(A) Formaldehyde (C) Ethanol
(B) Acetaldehyde (D) None of these

(5) The high pressure continuous chlorination of propylene yields _____.
(A) Allyl chlorides (C) Acid chlorides
(B) Ketones (D) None of these

(6) In manufacture of methyl chloride, gases are mixed and passed through a chlorination furnace operated at _____.
(A) 425°C (C) 475°C
(B) 450°C (D) 80°C

(7) Which catalyst is used in manufacture of carbon tetrachloride?
(A) Copper (C) Platinum
(B) iron boarings (D) Alluminium

(8) The reaction of ethylene oxide with ammonia is accelerated by _____.
(A) HCl (C) NaOH
(B) H_2O (D) HCOOH

(9) The methyl chloride, methylene dichloride and heavy ends are separated by _____.
(A) Vacuum distillation (C) Extraction
(B) Evaporation (D) Fractional distillation

(10) The reaction between methanol and ammonia in a continuous flow system produces _____.
(A) Ethanol (C) Methylamines
(B) Fromaldehyde (D) None of these

(1)

(P.T.O.)

Q.2 Answer the following.(attempt ten) [20]

(1) Write the uses of Acrylates.
(2) Write the chemical properties of acetylene.
(3) Write the uses of Melamine.
(4) Draw the flow sheet for manufacture of formic acid by pyrolysis of ethylene dichloride.
(5) Write the raw materials required for manufacture of glycerine from propylene via acrolein.
(6) Write the uses of ethanolamines.
(7) Draw the flow sheet for manufacture of chloroform from acetone and bleaching powder.
(8) Write the uses of sulfolane.
(9) Write the reaction for manufacture of carbon tetrachloride by chlorination of methane.
(10) Write the uses of DMF.
(11) Write the important properties of THF.
(12) Write the reaction for manufacture of alkylamines from alcohol and ammonia.

Q.3 (A) Discuss the manufacture of vinyl chloride from acetylene and HCl [05]
(B) Write a short note on 1,4 butane diol. [05]

OR

Q.3 With the help of flow diagram discuss the manufacture of phenol by cumene process. [10]

Q.4 (A) Write a short note on glycerine. [05]
(B) Explain manufacturing process of formic acid. [05]

OR

Q.4 (A) With the help of flow diagram discuss the manufacture of formaldehyde. [05]
(B) Write a short note on tri phenyl phosphate. [05]

Q.5 (A) Explain manufacturing process of dichloromethane. [05]
(B) Write a short note on N-alkylated ethanol amine. [05]

OR

Q.5 (A) Write the detail about manufacture process of chloroform. [05]
(B) With the help of flow diagram discuss the manufacture of mono-, di-, tri-ethanol amine. [05]

Q.6 (A) Write a short note on DMSO. [05]
(B) Write the manufacturing process of THF. [05]

OR

Q.6 (A) Write the manufacturing process of diethyl ether. [05]
(B) Write a short note on dioxane. [05]

— X —

(2)

(43 & A-22) SEAT No._____ No. of Printed Pages : 2

Sardar Patel University
B.Sc. (Sixth Semester) Examination
31st March 2017, Friday
Subject code: US06CICV03 (Polymer Science)
Industrial Chemistry (Vocational)

Time: 10:00 am to 1:00 pm **Total Marks: 70**

Q-1. Answer the following multiple choice questions: (10)

1.Fibers have low extensibility ranging from .....
(a) 10-20% (b) 100%
(c) 100-200% (d) b & c

2. Polymerization in which two or more chemically different monomers take part is called ____ Polymerization.
(a) Addition (b) Copolymer
(c) Chain (d) None of this

3. Which one is not thermosetting polymer?
(a) Polyethylene (b) Phenol formaldehyde
(c) Urea formaldehyde (d) Epoxy resin

4. The weight average mass of polymer is written as.....
(a) mv (b) mw
(c) mn (d) mm

5. The temperature boundary between plastic and elastic phase of polymer is denoted as
(a) Glass transition temperature (b) Melting point
(c) Boiling point (d) Vaporization point

6. What is the phenol formaldehyde ratio for produced resol?
(a) 1:1.4 (b) 1:0.8
(c) 8:1 (d) 1:1

7. How many isomers of dihydroxy diphenyl methane based on pH of the medium.
(a) 1 (b) 2
(c) 3 (d) 4

8. Reaction between phenol or a mixture of phenols with formaldehyde produced ____
(a) phenol-formaldehyde (b) Phenoplastic
(c) Phenolic (d) All of these

9. Nylon are _____.
(a) Polyamide (b) PF resin
(c) Amino Resin (d) Polycarbonate

10. Polyethylene synthesized by
(a)Fawiett & Gibson (b) Zeigler Natta
(c) Wurtz (d) None of these

(P.T.O)

Q-2 Answer the following short question (Any10). **(20)**

1. Enlist the methods & techniques of polymerization.
2. What is molecular weight of polypropylene with D.P of 7×10^4?
3. Define the following term:
   Monomer, Repeat unit
4. What is glass transition temperature?
5. Enlist & express the methods of average molecular weight.
6. Differentiate two types of motion exhibited within a polymeric material.
7. How the phenol is prepared?
8. Give the preparation of isocyanate by phosgenation processes.
9. Which are the commonly used isocyanate and polyol.
10. Compare the properties of LDPE & HDPE.
11. Enlist the various methods for polyethylene synthesis.
12. Give the name of the important copolymers of styrene.

Q-3 (A) Explain the classification of polymer according to thermal response and molecular arrangements. **(05)**

(B) Write the mechanism of addition polymerization. **(05)**

OR

Q-3 (A) Explain in detail Homopolymer and Copolymer with suitable example. **(05)**

(B) The functionality of monomer is not a constant parameter. Justify it. **(05)**

Q-4(A) Explain in detail the end group analysis method. **(05)**

(B) Explain the relationship between glass transition temperature and melting point. **(05)**

OR

Q-4(A) Explain the concept of number average and weight average molecular weight. **(05)**

(B) Explain the relation between structural regularity & crystallisability. **(05)**

Q-5 (A) Explain the process of forming phenol formaldehyde (Resol) resin. **(05)**

(B) Give the manufacturing process of polyurethane. **(05)**

OR

Q-5(A) Explain the process of forming urea formaldehyde resin. **(05)**

(B) What are raw materials of epoxy resin? What are their principle field of application? **(05)**

Q-6 Explain commercial process for manufacturing of polyethylene. **(10)**

OR

Q-6 Describe with flow diagram the suspension process for manufacturing polystyrene. **(10)**

— X —

SEAT No._____ No. of Printed Pages : 2

[439A21] SARDAR PATEL UNIVERSITY

B.Sc. (6th Semester) External Examination

Subject: US06CICV04 (Industrial Management & Economics-II)

Industrial Chemistry (Vocational), Monday, 3rd April 2017

Time: 10:00 to 01:00 p.m. Total Marks: 70

Q.1 Answer the following MCQs. Attempt all questions. **[10]**

1. The term economic comes from_____.

(A) Greek (B) Germany (C) US (D) Portugal

2. In which format demand is represented?

(A) Graph (B) Table (C) Both (D) None of these

3. Measures of economic value are based on _____.

(A) What people want the reference? (B) Whom people want the reference

(C) Why people want reference model? (D) None

4. Wear and tear, corrosion accidents are the example of which depreciation?

(A) Physical depreciation (B) Fundamental depreciation (C) None of these (D) Both A & B

5. The price which would be obtained for the property if it was sold in the open market is called_____.

(A) market value (B) replacement value (C) present Value (D) none of these

6. The supply curve reflect_____.

(A) marginal curve (B) demand curve (C) both (D) none of these

7. Organization plan is sub topic of _____.

(A) management of resulting enterprise (B) determination of required resources

(C) development of business plan (D) identification and evaluation of opportunities

8. Determine resources needed are sub topic of _____.

(A) management of resulting enterprise (B) determination of required resources

(C) development of business plan (D) identification and evaluation of opportunities

9. Which questions are related to inventory model?

(A) How much to order? (B) When to order? (C) Both (D) None of these

10. EOQ stands for _____.

(A) Economic Order Quantity (B) Economic Order Quality
(C) Economic Object Quantity (D) None of these

(PTO)

Q.2 Attempt any (**Ten**) out of twelve questions. [20]

1. What is the formula of elasticity of demand?
2. Define: microeconomic and macroeconomic.
3. What is the formula of elasticity of supplier?
4. What is depreciation?
5. What are the methods of depreciation?
6. What is the equation of Straight line method for finding value of depreciation?
7. Write the advantages and disadvantage of Franchise.
8. What are the factors determining size of business?
9. Define Material Management.
10. What are the aims of material management?
11. Define Inventory and Inventory Management.
12. What are the views of TQM?

Q.3 (A) Write a note on Economies in production. [05]

(B) What is economic? Explain Demand and Supply in economics. [05]

OR

Q.3 (A) Describe about macroeconomics. [05]

(B) Describe in detail about revenue. [05]

Q.4 (A) Define depreciation? Explain Any Two methods of depreciation calculation. [05]

(B) Write a short note on Double Declining Balance method. [05]

OR

Q.4 (A) Describe in details selecting some aspects of Marketing. [05]

(B) Explain in details about pricing policy. [05]

Q.5 Describe about Scale of Operation and size of firm. [10]

OR

Q.5 Explain in details Entrepreneurial Decision [10]

Q.6 (A) What is the importance of inventory? Explain in details. [05]

(B) Explain in details about Total Quality Control. [05]

OR

Q.6 (A) Explain the concept of total quality management in detail. [05]

(B) What is the importance of material management in any organization? [05]

----------x--------Best of Luck----------x----------

SEAT No._____ No. of Printed Pages : 2

[194]

Sardar Patel University

B. Sc. (Semester – VI) Examination

Date: 8th April 2017 Time: 10:00am to 01:00pm

Industrial Chemistry Vocational

COURSE NO: US06CICV05 (PHARMACEUTICALS - II)

Notes: Figures to the right indicate full marks. Total marks: 70

Q. 1 Answer the following multiple choice questions: (10)

1. _____are the structural units of nervous system, comprising of fibres which convey electric impulse to nerve cell.
   A. Proton C. Neuron
   B. Neutron D. Both (a) and (b)
2. Introduction of nitro group in_____compounds increases their toxicity.
   A. Aliphatic C. Aromatic
   B. Cyclic D. None of them.
3. Human Blood contains_____% of protein.
   A. 5.6 C. 6.5
   B. 6.9 D. 6.0
4. Sulphonamides can replace _____drugs.
   A. Anti-ulcer
   B. Anti-inflamatory.
   C. Anti-biotic
   D. Anti-tuberculosis
5. Which of the following can be used in the treatment of leprosy?
   A. Sulphathiazole. C. Sulphadiazine.
   B. Sulphadoxine. D. Sulphapyridine.
6. The symptoms of scurvy is.....
   A. Weight loss. C. Loosening of teeth.
   B. Swelling of gums. D. All of these
7. Which of the following hormone is secreted in Pancreas?
   A. Thyroid C. Testes.
   B. Ovaries. D. Insulin.
8. Which of the following hormone is secreted in Duodenal?
   A. Insulin C. Adrenaline.
   B. Ovaries. D. Enterogasterone.
9. In aerobe condition, oxygen required by organisms is.....
   A. 12% C. 31%
   B. 11% D. 21%
10. The substance, containing microorganism or other material that is introduced in inoculation is known as.....
    A. Medium C. Agar
    B. Culture D. Inoculum.

(PTO)

Q. 2. Answer the following short questions. (Any Ten) (20)

1. Explain the mechanism of drug binding.
2. Define term "Pharmacophore" with suitable examples.
3. Explain the effect of structural isomerism on activity of drug.
4. Write the synthesis of "Analgin".
5. Define term "Anti-inflammatory" drugs.
6. write synthesis of "Paracetamol"
7. Define term "Vitamin".
8. Give deficiency disease of Vitamin A1.
9. Give the structure of "Vitamin K1"
10. Enlist various properties of "Penicillin".
11. Define terms Fermentation and Culture.
12. Define terms Sterilization.

Q. 3 Explain in detail the effects of different functional groups on chemical activity of drug. (10)

OR

Q. 3. Explain in detail classification of drugs on the basis of therapeutic action. (10)

Q. 4 Write detail note on N^1 and N^4 substituted Sulfa drugs. (10)

OR

Q. 4 Write a notes on Anti-pyretics and Analgesics drugs. (10)

Q. 5 Give classification of Hormones and write a note on Sex hormones. (10)

OR

Q. 5. Write note a note on occurrence, properties and deficiency diseases of Vitamin-B complex and Vitamin-H. (10)

Q. 6

A. What is Nutrients? Explain various nutrients in detail. (05)
B. Explain the various factors affecting the fermentation process. (05)

OR

Q. 6

A. Write short note on "Tetracycline". (05)
B. Enlist the characteristics of Enzymes. (05)

—X—

SEAT No._____ No. of Printed Pages : 2

[282A20]

SARDAR PATEL UNIVERSITY
B.Sc. Semester-6
Industrial Chemistry (Vocational)
US06CICV06-SELECTED TOPICS
7TH APRIL 2017

TIME:10 a.m. to 1:00 p.m. **MARKS-70**

Note: Figures to the right indicates full marks.

Q.1 Answer the following MCQs **(10)**

1. The principal reason for preparing engineering and economic evaluation of projects at the research stage is _____ projects that are economically unsound.
   (a) To detect (b) To develop (c) To reject (d) To modify

2. How many shifts of operations are arranged in around the clock operation schedule?
   (a) 1 (b) 2 (c) 5 (d)3

3. Which of the following is used to translate written description of chemical process into workable pattern?
   (a) Process estimation (c) Process equipment
   (b) Process research (d) Engineering flow diagram

4. The mathematical statement of proportional action is:
   (a) $dv/dt = -k\Theta$ (b) $V = -k .d\Theta/dv$ (c) $V = -k \Theta$ (d) None of these

5. In flowing control action undesirable features are:
   (a) OFF set (b) Long recovery time (c) Both (a) & (b) (d) None of these

6. Distribution of tiny liquid particles in liquid matrix is called:
   (a) Suspension (b) Emulsion (c) Surface tension (d) Dispersion

7. In which of following method lock and key theory is used?
   (a) Homogeneous catalysis (c) Acid base catalysis
   (b)Heterogeneous catalysis (d) Enzyme catalysis

8. Nanofiltration is used for?
   (a) Water softening (b) Water hardening (c) Neutralizing water (d) None of these

9. P^Hrange in nanofiltration should be:
   (a) 3-9 (b) 9-10 (c)1-3 (d) 9-12

10. PVDF is used in manufacturing of:
    (a) Ultra membrane (c) Electro membrane
    (b)Nano membrane technology (d) None of these

C 1 7

(PTO)

Q.2 Answer the following short questions (Any 10) **(20)**

1. What is Fixed bed reactor?
2. What is semicommercial plant?
3. Enlist various emulsifiers for W/O emulstions
4. What are humectants? Give examples
5. Enlist the functions of surfactants in cosmetic industry.
6. Enlist the two compartments for electro dialysis process.
7. Which materials are used as anode and cathode in electrodialysis?
8. Write advantages of automatic control system
9. What is setpoint?
10. What is control valve?
11. Explain the concept of feedback control.
12. What is mean by final control element?

Q.3 Explain Pilot plant and give check list for investigating pilot plant. **(10)**

OR

Q.3 Explain process design with choice and selection of process cycle in detail. **(10)**

Q.4 Explain industrially important catalytic processes and applications. **(10)**

OR

Q.4 Write short note on:
i.Surfactants ii.Micellformation **(10)**

Q.5 Classify the membranes according to morphology and explain the membrane separation process with phase inversion method. **(10)**

OR

Q.5 Write a short note on the following:
i. Nano filteration ii. Poly(vinyl fluoride) **(10)**

Q.6 (a) Explain three types of variables associated with process. **(05)**
Q.6 (b) Discuss the elements of automatic control system. **(05)**

OR

Q.6 Explain the controlling of batch process and continuous process **(10)**

_____x **Good Luck** x _____

SEAT No._____ No. of Printed Pages : 2

(312A22)

SARDARPATEL UNIVERSITY V.V.NAGAR

T.Y B.Sc. Sem-VI EXAMINATION, Instrumenatation Vocational

SUB. CODE:-US06CIN0V6 Signal conditioning and communication.

DATE:-07/04/2017 TIME:-10:00 am to 1:00 pm MARKS-70

Q-1 Choose correct answer [10]

1.. In amplitude modulation process the _____of carrier is constant.
(A) Frequency (C) Phase
(B) Amplitude (D) None of these

2. The problem of flicker is solved by _____ scanning.
(A)Interlaced (C)Rectangular
(B) No scanning (D) None of these

3. _____ colour mixing is used colour TV.
(A) additive (C) substractive
(B) multiplicative (D) None of these

4. In plot of frequency spectrum of Amplitude voltage their are _____ side-bands.
(A) One (C) Two
(B) Three (D) None of these

5. IF frequency in case of AM Radio Receiver is _____.
(A) 455 Khz (C) 455Hz
(B) 45Hz (D) None of these

6. The total no lines scanned per second in india in TV is _____.
(A) 15625 (C) 1562
(B) 156 (D) None of these

7. Clamping circuit is used in _____.
(A) Television (C) Radio
(B) Computer. (D) None of these

8. _____ gun is used in shadow-mask picture tube.
(A) Delta (C) Rectangle
(B) Square (D) None of these

9. Trintron colour picture tube uses_____gun's
(A) Single (C) Triple
(B) Double (D) None of these

10. Bourdon tube is not used in _____ telemetry.
(A) Voltage (C) Current
(B) Radiofrequency (D) None of these

Q-2 Short answer type question. (any ten) [20]

1. Explain frequency modulation drawing necessary diagram?
2. Draw the circuit of linear diode detector in radio-receiver.
3. What is the function of frequency mixer.
4. What is Aspect Ratio.
5. List camera tube characteristic.
6. Explain additive colour mixing drawing diagram.
7. Explain substractive colour mixing drawing diagram.
8. Draw a neat diagram showing principle of vidicon camera.
9. Draw the block diagram of general telemetry system.
10. Explain what is telemetry.
11. Draw the Block diagram of V.H.F tuner.
12. Define modulation.

Q.3	Give an account of Amplitude modulation.	[10]
	OR	
Q.3	Draw the block diagram of superhetrodyne radio receiver and explain function of each block.	[10]
Q.4	Draw the block diagram of black & white T V Receiver and also explain function of each block.	[10]
	OR	
Q.4	Draw the block schematic arrangement of colour TV camera and explain its working.	[10]
Q.5	Give an account of image orthicon tube.	[10]
	OR	
Q.5	Give an account of composite video-signal	[10]
Q.6	List different types of land line telemetry, Explain any two in detail	[10]
	OR	
Q.6	Give an account of pulse code modulation telemetry.	[10]

—X—

(2)

(47 & A-24) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. (6th Sem) Examination - March/April 2017 [CBCS]

Monday, 27th March, 2017

10:00 AM - 01:00 PM

US06CINS01 (Instrumentation)

8085 Microprocessor Architecture and Programming - 2

Maximum Marks: 70

Que 1 **Each question below gives a multiple choice of answers. Choose the most appropriate one.** **[10]**

1 A Counter is a Typical Application of the _____.

a) Continuous Loop **b)** Conditional Loop

c) Both a) and b) **d)** None of these

2 The Conditional Loop Usually Include _____.

a) Counting **b)** Indexing

c) Both a) and b) **d)** None of these

3 _____: Each Bit is Shifted to the Adjacent Left Position. Bit D_7 Becomes D_0. CY Flag is Modified According to Bit D_7.

a) RAL **b)** RRC

c) RAR **d)** None of these

4 _____: Each Bit is Shifted to the Adjacent Left Position. Bit D_7 Becomes the Carry Bit and the Carry Bit is Shifted into D_0. CY Flag is Modified According to Bit D_7.

a) RRC **b)** RLC

c) RAR **d)** None of these

5 _____: Load Stack Pointer.

a) LXI **b)** PUSH

c) POP **d)** None of these

6 _____: Retrieve Register Pair From Stack.

a) LXI **b)** PUSH

c) POP **d)** None of these

7 To Increase the Driving Capacity of the Buses, a Unidirectional Bus Driver is used for the _____ Bus.

a) Address **b)** Data

c) Both a) and b) **d)** None of these

8 The 8085 Microprocessor is Designed to Execute _____ Different Instruction Types.

a) 16 **b)** 74

c) 256 **d)** None of these

9 To Execute an Instruction, the 8085 Needs to Perform Various Operations such as _____.

a) Memory Read/Write **b)** I/O Read/Write

c) Both a) and b) **d)** None of these

10 A Program with a _____ Does Not Stop Repeating the Task Untill the System is Reset.

a) Continuous Loop **b)** Conditional Loop

c) Both a) and b) **d)** None of these

Que 2 **Short Questions (Attempt any TEN)** **[20]**

1. Explain: RLC.
2. Explain: CMP R/M.
3. Differentiate: Timer and Counter.
4. Differentiate: PUSH and POP.
5. Differentiate: JUMP and CALL.
6. What is Subroutine?
7. Explain Briefly Opcode Fetch Machine Cycle.
8. If the Clock Frequency is 5 MHz, How Much Time is Required to Execute an Instruction of 18 T - States?
9. Explain what Memory Read Machine Cycle is.
10. Explain: STAX B/D.
11. Explain: MOV R, M.
12. Write Instructions to Load 59_H in Memory Location 2040_H, and Increment the Contents of the Memory Location.

Que 3 **[A]** Draw the Timing Diagram of OUT Instruction **[05]**

[B] Give an Account of Absolute Vs. Partial Decoding. **[05]**

OR

[C] Draw the Timing Diagram of IN Instruction.. **[05]**

[D] Write a note on Peripheral I/O Instructions. **[05]**

Que 4 **[A]** Sixteen Bytes of Data are Stored in Memory Locations Starting from 2050_H. Add All the Data Bytes. Use Register B to Save any Carries Generated while Adding the Data Bytes. Display the Entire Sum at Two Output Ports. **[05]**

[B] Write a Program to Add the Ten Data Bytes Stored in Memory Locations Starting from 1050_H, and Display the Sum. The Sum does not Generate a Carry. Use Register Pair DE as a Memory Pointer to Transfer a Byte from Memory into a Register. **[05]**

OR

[C] Five Bytes of Data are Stored in Memory Locations at $D050_H$ to $D054_H$. Transfer the Entire Block of Data to New Memory Locations Starting at $D070_H$. **[05]**

[D] A String of Twelve Data Bytes is Stored Starting from Memory Location $E000_H$. The String Includes Some Blanks. Write a Program to Eliminate the Blanks from the String. **[05]**

Que 5 **[A]** A Set of Five Readings is Stored in Memory Locations Starting at 1050_H. The Readings are Expected to be Positive. Write a program to **[05]**

1. Check each Reading to Determine whether it is Positive or Negative.
2. Reject all Negative Readings
3. Add All Positive Readings
4. Store FF_H in Memory Location 1070_H when the Sum Exceeds Eight Bits; otherwise, Store the Sum.

[B] Write a Program to Generate a Square Wave with Period of 400 Micro - Seconds. Use Bit D_0 to Output the Square Wave. **[05]**

OR

[C] Design an Up - Down Counter to Count From 0 to 9 and 9 to 0 Continuously with a 1.0 Second Time Delay Between Each Count and Display the Count at One of the Output Ports. **[05]**

[D] Write a Program to Count from 0 to 15_H with a Time Delay of 150 ms between Each Count. After the Count 15_H, the Counter should Reset itself and Repeat the Sequence. Use Register Pair BC as a Delay Register. **[05]**

Que 6 **[A]** Write a Program to Convert BCD Number into Binary. **[10]**

OR

[B] Write a Program to Convert BCD Number into Seven - Segment LED Code. **[10]**

(27A & A-24) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

T.Y.B.Sc (Semester - VI) Examination, (under CBCS)

USO6CINS02 (Process Measurement Technique-II)

Tuesday , 28th March 2017

10.00 A.M. – 01.00 P.M.

Marks: 70

Q.1 Multiple choice questions. **[10]**

(1) The _____ instruments is a rate meter.
- (a) venturimeter
- (b) hot wire anemometer
- (c) nutating disk meter
- (d) current meter

(2) The cylinder and piston type flow meters are a _____type.
- (a) variable head
- (b) vortex
- (c) variable area
- (d) velocity

(3) A pitot-static tube is measure _____ pressure.
- (a) static
- (b) dynamic
- (c) total
- (d) difference between total and static

(4) The venture tubes are generally made of _____.
- (a) phosphor bronze
- (b) cast iron
- (c) nickel
- (d) all of the above

(5) An electromagnetic flow meter generates an e.m.f. which is a function of _____.
- (a) dynamic pressure
- (b) flow velocity
- (c) discharge
- (d) pressure

(6) The hot wire anemometer is used to measure _____.
- (a) pressure in gases
- (b) gas velocities
- (c) liquid discharges
- (d) wind velocities at airports

(7) LVDT is used for the measurement of _____.
- (a) displacement
- (b) motion
- (c) force
- (d) pressure

(8) The torque (τ) is defined by τ = _____
- (a) $r \times F$
- (b) $r \times P$
- (c) $r \times V$
- (d) $r \times m$

(9) The electrical tachometers consist of transducer which converts the rotational speed in to _____ signal.
- (a) electrical
- (b) frequency
- (c) mechanical
- (d) resonance

(10) The pick-up utilizes a rotating shaft to intercept a beam of light falling on a _____cell.
- (a) photographic
- (b) photoconductive
- (c) photo mechanical
- (d) photo optical

(P.T.O)

Q.2 **Short answer type questions (Attempt any Ten)** **[20]**

(1) State the advantages and limitations of venturi flow meter.
(2) Draw the figure of Pitot tube.
(3) Draw the figure of hot wire anemometer.
(4) Give any two applications for stain gauge load cell.
(5) Draw a block diagram on pressductors load cell.
(6) Definitions: Force, Torque and its units.
(7) Define: Proximity sensors.
(8) Give the classifications of tachometers.
(9) Define; Speed and its unit.
(10) Give the limitations of centrifugal force tachometer.
(11) Draw the block diagram for inductive type pick-up tachometer.
(12) Draw the figure for optical torsion meter.

Q.3 Write a note on: (1) Ventruri flow meter and (2) Flow nozzle. **[10]**

OR

Q.3 Define variable head meters and derive the Bernoulli's equation for venturimeter for incompressible fluid. **[10]**

Q.4 **(a)** Discuss and derive the equation of ultrasonic flow meters. **[6]**
(b) Write a short note on an electromagnetic flow meter. **[4]**

OR

Q.4 **(a)** State and derive the equation of open channel meters. **[6]**
(b) Discuss the mass flow measurement with necessary figure. **[4]**

Q.5 **(a)** Discuss the scales and balances method for force measurement with necessary figure and equations. **[6]**
(b) Write a short note on hydraulic load cell. **[4]**

OR

Q.5 **(a)** Write a note stain gauge load cell with necessary figure. **[6]**
(b) Explain the centrifugal force tachometers in briefly. **[4]**

Q.6 **(a)** Discuss the mechanical disk-type stroboscope. **[6]**
(b) Write a short note on revolution counter. **[4]**

OR

Q.6 **(a)** Write a note on DC tachogenerators. **[6]**
(b) Discuss the inductive type pick-up tachometer. **[4]**

— X —

(44) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
T.Y.B.Sc. Examination, SIXTH Semester
Friday, 31st March 2017
Time : 10.00 am To 01.00 pm
Instrumentation Course Code : USO6CINS03
Course Title : Advanced Control System

Total Marks : 70

Q-1 Write answers to the following multiple choice questions in your answer book by selecting the proper option. **[10]**

(1) Transfer function of a feedforward controller is a relationship between manipulated and _____ variables.
(a) static (b) dynamic (c) controlled (d) disturbance

(2) In MBC computers use a process model to make ____ decisions.
(a) predicted (b) feedback (c) process (d) control

(3) In cascade control, the inner loop is also called ____ loop.
(a) secondary (b) primary (c) lower (d) higher

(4) The process in which the microprocessor scans the channels to read the data is called
(a) polling (b) scanning (c) processing (d) modelling

(5) In interrupt scanning, primary facility is provided to check for the ____ of limits in the data scanned.
(a) variations (b) violations (c) validation (d) visualization

(6) In old days (1960s) people were using _____ control for the plant processes.
(a) centralized (b) distributed (c) cascaded (d) optimized

(7) Which one of the following is most suitable as the requirement for a manager?
(a)process dynamics (b)availability of logs
(c)both (a)&(b) (d)none of these

(8) The person who undertakes the maintenance of a large variety of instruments in a plant is generally called_____ engineer.
(a) maintenance (b) plant (c) design (d) supervising

(9) In order to apply a computer system to control a technical process its ___ behavior should be stored in the computer.
(a) linear (b) non-linear (c) dynamic (d) exponential

(10) In mathematical modelling the system with distributed parameters are described by ____ differential equations.
(a) non-linear (b) linear (c) quadratic (d) partial

Q-2 Answer the following questions in brief. (Answer any Ten Questions) **[20]**

(1) Enlist the different types of advanced control strategies.
(2) Enlist any four advantages of advanced control.
(3) What are the requirements of ideal control methodology?
(4) Write a short note on Downloading of limits from central Computer.
(5) Write a short note on satellite communications.
(6) Enlist the basic functions of SCADA systems.
(7) Provide the list of personnel who interact directly with the SCADA system.
(8) Enlist any four requirements of a plant operator.
(9) Draw the block diagram showing decentralized computer control concept. (PTO)

(10) Enlist the different control strategies used in modern control theory.
(11) Enlist any four analytical methods of parameter estimation in a mathematical modelling.
(12) Enlist any four statistical methods of parameter estimation in a mathematical modelling.

Q-3 Describe the different aspects of feed forward control in case of three tank composition control system. Also establish relationship between manipulated and disturbance variable. **[10]**

OR

Q-3 (a) Describe the adaptive control in detail. **[5]**
(b) What is predictive control? Discuss the model based control in detail. **[5]**

Q-4 (a) Write a note on data processing. **[5]**
(b) Give an introduction to SCADA. **[5]**

OR

Q-4 (a) Explain how the data read from the output of ADC is converted to equivalent engineering units? **[5]**
(b) Write a detailed note on channel polling. **[5]**

Q-5 (a) Write a note on plant operator's requirements. **[5]**
(b) Discuss about the requirements of manager/supervisor. **[5]**

OR

Q-5 (a) Write a note on maintenance engineer's requirements. **[5]**
(b) Discuss the concept of distributed and centralized control in detail. **[5]**

Q-6 (a) Write a note on system modelling. **[5]**
(b) Define the terms modelling and simulations in detail with the help of necessary equations and diagrams. **[5]**

OR

Q-6 (a) Write a note on model evaluation and improvement. **[5]**
(b) Write a note on application examples of modelling and simulation. **[5]**

●●●●●●●

— x —

SEAT No._____ No. of Printed Pages : 2

[448A23]

SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

B.Sc. (6th Sem) Examination - March/April-2017 [CBCS]

Monday, 3rd April, 2017

10:00 AM - 01:00 PM

US06CINS04 (Instrumentation)

Programmable Logic Controller (PLC) - 2

Maximum Marks: 70

Que 1 Each question below gives a multiple choice of answers. Choose the most appropriate one. **[10]**

1 In Digital Electronics, a One Shot is a _____ Multivibrator with an Output that is ON for a Predetermined Length of Time.

a) Astable b) Monostable

c) Bistable d) None of These

2 A _____ can be Utilized to Perform an Operation called the Timed Sequencer.

a) Flasher b) Sequencer

c) Both a) and b) d) None of These

3 The _____ Value is the Maximum Count Allowed for the Counter.

a) ACTUAL b) PRESET

c) Both a) and b) d) None of These

4 _____: is/are the Command/s of PLC Mnemonic Programming Language.

a) LD b) STO

c) Both a) and b) d) None of These

5 The Termination Command for a Line of Code is generally _____.

a) STO b) OUT

c) LD d) None of These

6 _____ Command can be Utilized in place of LD Command.

a) STR b) STO

c) Both a) and b) d) None of These

7 _____: Type/s of PLC Output/s.

a) Relay b) Solid State

c) Both a) and b) d) None of These

8 The _____ Relay Contact is a Single Pole Normally Closed Contact that is similar to a Single Normally Closed Switch.

a) FORM A b) FORM B

c) FORM C d) None of These

9 If the Voltage Being Measured will Never be Negative, then _____ Input is the Best Choice.

a) Unipolar b) Bipolar

c) Both a) and b) d) None of These

10 _____: is also Called Gain Error.

a) Constant Offset Error b) Percentage Offset Error

c) Both a) and b) d) None of These

(PTO)

Que 2 Short Questions (Attempt any TEN) **[20]**

1 Explain Briefly Flip Flop in Terms of Programmable Logic Controller (PLC).
2 What is Flasher?
3 Explain Importance of Master Control Relays.
4 Enlist Commands used in Mnemonic Programming Code.
5 How Mnemonic Programming Code differs from Ladder Diagram Programming Language?
6 Differentiate: Simple Branches and Complex Branches.
7 Explain Briefly FORM A Relay Contact.
8 Differentiate: Transistor Sinking Output Wiring and Transistor Sourcing Output Wiring.
9 Differentiate: PLC Isolated Inputs Wiring and PLC Non-Isolated Inputs Wiring.
10 Explain Number of Bits of Resolution in Terms of PLC Analog Input.
11 What is Voltage Resolution?
12 Define: Input Range in Terms of Analog Input.

Que 3 **[A]** Write a note on One Shot with necessary Ladder Diagram. **[05]**
[B] Explain D Flip Flop with respect to PLC. **[05]**

OR

[C] Give an account of J-K Flip Flop with respect to PLC. **[05]**
[D] Discuss PLC Sequencer. **[05]**

Que 4 **[A]** Draw Ladder Diagram for AND-OR-AND Function. Write Mnemonic Programming Code for AND-OR-AND Function. **[05]**
[B] Draw Ladder Diagram for OR Function. Write Mnemonic Programming Code for OR Function. **[05]**

OR

[C] Write a detailed note on Complex Ladder Rung. **[05]**
[D] Draw Ladder Diagram for AND Function. Write Mnemonic Programming Code for AND Function. **[05]**

Que 5 **[A]** Write a detailed note on PLC Power Connection with necessary Wiring Diagrams. **[10]**

OR

[B] Discuss PLC Relay Outputs with necessary Wiring Diagrams. **[10]**

Que 6 **[A]** Give an Account of Constant Offset Error & Percentage Offset Error. **[05]**
[B] A voltage of 3.500 Volts is Applied to an 8 - bit, 5 volt Unipolar Analog Input of a PLC. The PLC Analog Input Register shows a Value of 263_8. Is the Analog Input working correctly? **[05]**

OR

[C] Discuss Analog Output and Analog Data Handling. **[05]**
[D] A 12-Bit, 10 Volt Bipolar Analog Output has a Maximum Output Current Capability of 20 mA. It is Connected to a Load that has a Resistance of 330 ohms. Will this System Work Correctly? **[05]**

—X—

No. of Printed Pages : 2

SEAT No._____

[20A]

SARDAR PATEL UNIVERSITY
T.Y.B.Sc. Examination, SIXTH Semester
Saturday, 8th April 2017
Time : 10.00 am To 01.00 pm
Instrumentation Course Code : USO6CINS05
Course Title : Industrial Electronics - II

Total Marks : 70

Q-1 Write answers to the following multiple choice questions in your answer book by selecting the proper option. [10]

(1) If the field of a synchronous motor is under-excited, the power factor will be
(a) lagging (b) leading (c) unity (d) more than unity

(2) In a synchronous motor, the magnitude of stator back emf E_b depends on ____ of the motor.
(a) speed (b) load (c) rotor flux (d) d.c. excitation

(3) The electric motor in which both the rotor and stator fields rotate with the same speed is called _____ motor.
(a) dc (b) charge (c) synchronous (d) universal

(4) Operation of stepper motors at high speeds is referred to as ____.
(a) fast forward (b) slewing (c) inching (d) jogging

(5) A stepper motor may be considered as a _____ converter.
(a) dc to dc (b) ac to ac (c) dc to ac (d) digital to analogue

(6) The planer construction of SCR is generally useful in ____ power applications.
(a) high (b) low (c) zero (d) medium

(7) A thyristor is generally a ____ layer device.
(a) one (b) two (c) three (d) four

(8) In case of SCR the total turn OFF time t_q = _____.
(a) $t_{rr} + t_{gr}$ (b) $t_{rr} - t_{gr}$ (c) t_{rr} / t_{gr} (d) $t_{rr} \cdot t_{gr}$

(9) The delay angle $\alpha° =$ ____ x 180°.
(a) $V_{control}/V_{st}$ (b) $V_{st}/V_{control}$ (c) $V_{st} - V_{control}$ (d) $V_{control} - V_{st}$

(10) The integrated circuits TCA780 are used to provide____ gate trigger signals to the thyristors.
(a) advanced (b) edged (c) delayed (d) customized

Q-2 Answer the following questions in brief. (Answer any Ten Questions) [20]

(1) Explain how synchronous motor can be used for voltage regulation.
(2) Enlist some specific applications of synchronous motors.
(3) Enlist any four reasons for the starting failure of a synchronous motor.
(4) Write a short note on applications of PMDC motors.
(5) Enlist the types of stepper motors.
(6) How does the excitation of synchronous motor affect power factor?
(7) Draw the characteristic curves of TRIAC.
(8) Plot the characteristic curves of SCR.
(9) Draw the characteristic curves of UJT.
(10) Enlist any four applications of SCR.
(11) Write a short note on dc-side voltage of an idealized single-phase converter.
(12) Draw the circuit diagram of a three phase practical thyristor converter. (PTO)

Q-3 (a) Explain the working of synchronous motor on load with constant excitation. [5]

(b) Discuss the power flow in a synchronous motor with the help of block diagram. [5]

OR

Q-3 (a) Enumerate the characteristic features of synchronous motor. [5]

(b) Describe the principle of operation and methods of starting of synchronous motor. [5]

Q-4 (a) With the help of necessary figure explain the construction and working of PMDC motors in detail. [5]

(b) What is step angle? Giving a brief introduction, derive the equations for step angle, resolution and the stepping frequency of stepper motor. [5]

OR

Q-4 With the help of necessary figures and diagrams discuss the construction and different working methods of Variable Reluctance stepper motors. [10]

Q-5 (a) Discuss the various turn off mechanism of SCR. [5]

(b) Discuss the construction and working of a UJT in detail. [5]

OR

Q-5 (a) Write a note on UJT as a relaxation oscillator. [5]

(b) Discuss the various turn ON methods for SCR. [5]

Q-6 (a) With the help of necessary equations and figures explain the basic thyristor circuit. [6]

(b) With the help of necessary diagram explain how rectification and inversion is produced by a Line-frequency controlled converter. [4]

OR

Q-6 (a) Give a detailed account of the idealized single phase converter circuits using the necessary figures and equations. [6]

(b) Write a note on thyristor gate triggering. [4]

• • • • • • •

SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

[29]

T.Y.B.Sc. Examination, SIXTH Semester

Friday, 7th April 2017

Time : 10.00 am To 01.00 pm

Instrumentation Course Code : USO6CINS06

Course Title : Analytical And Bio – Medical Instrumentation

Total Marks : 70

Q-1 Write answers to the following multiple choice questions in your answer book by selecting the proper option. [10]

(1) In NMR angular momentum associated with the spin is _____.
(a) $nh/2\pi$ (b) $2\pi/nh$ (c) $n\pi/2h$ (d) $2h/n\pi$

(2) To obtain a mass spectrum, the electric field is kept between
(a) 50 – 70 V (b) 60 – 70 V (c) 50 – 60 V (d) 30 – 50 V

(3) Gas-filled photo-emissive cell consists of small quantities of inert gas like ___.
(a) Neon (b) Argon (c) Krypton (d) Zenon

(4) What is the equation of an alternative plotting calibration curve?
(a) C = K + A (b) C = K·A (c) C = K – A (d) C = K/A

(5) In the absorption instruments, as a detecting system, _____ is used.
(a) photo emissive tube (b) photovoltaic tube
(c) photomultiplier tube (d) phototransistor

(6) The diagnostically useful frequency range of Electrocardiograph is usually _____.
(a) 0.01 to 140 Hz (b) 0.10 to 150 Hz (c) 0.05 to 150 Hz (d) 0.25 to 70 Hz

(7) The sample handling techniques, _____ window material is commonly used.
(a) KCl (b) $AgCl_2$ (c) $Cacl_2$ (d) NaCl

(8) The full form of ECG is
(a) Electromyogram (b) Electrooculogram
(c) Electrohysterogram (d) Electrocardiogram

(9) The full form of EMG is
(a) Electromyogram (b) Electric memo graphy
(c) Electromagnetic graph (d) Electro memo gram

(10) In liquid cells, the rate of transmittance lies between _____.
(a) 5 to 10 % (b) 15 to 70 % (c) 70 to 95 % (d) 10 to 15 %

Q-2 Answer the following questions in brief. (Answer any Ten Questions) [20]

(1) Enlist the types of monochromators.
(2) Enlist the types of optical filters.
(3) Draw the figure of photovoltaic cell.
(4) Enlist the types of detectors.
(5) Draw the figure of NMR instrument.
(6) Enlist the factors on which principle of NMR is based.
(7) Define systolic and diastolic pressure.
(8) Draw the block diagram of EEG machine.
(9) Draw the block diagram of ECG machine.
(10) Write a note on optical filter.
(11) Write a brief note on gas cell.
(12) Define resting potential.

PTO

Q-3 (a) Explain photomultiplier tube. [5]

(b) Explain the photovoltaic cell with necessary figure. [5]

OR

Q-3 Explain in detail Beer-Lambert's law. Also explain how it deviates. [10]

Q-4 (a) Explain pre-amplifier for use with photoconductive infrared detector. [5]

(b) Explain in detail Gas Cell. [5]

OR

Q-4 (a) Write a note on pneumatic detector. [5]

(b) Explain in detail Quantum type detector. [5]

Q-5 What is mass spectrometer? Explain in brief the types of mass spectrometer. Discuss the application of it. [10]

OR

Q-5 With necessary diagram explain the principle of NMR. [10]

Q-6 (a) Discuss the origin of Bio-electric signals. [5]

(b) Write a note on EGC. [5]

OR

Q-6 (a) Write a note on Electroencephalography (EEG). [5]

(b) Write a note on frequency response and damping adjustment of the fluid filled Catheters. [5]

• • • • • • •

(48&A-15) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
T.Y. B.Sc. EXAMINATION, VI SEM

Date : 27th MAR 2017, Monday Time :10:00am To 01:00pm
Session : Morning Sub: Relational Database Management System -II
Course No : US06CINT01 Total marks : 70

Q – 1 Multiple Choice Question [10]

i) _____ command use to suppress the duplicate value by default in the column or expression.
a) Order By b) Break On c) Compute d) Skip

ii) To display column title on more than one line, use _____ where you want to begin a new line.
a) Break b) || c) | d) enter

iii) SQLPLUS ignores anything on a line that begins with _____
a) Start b) Run c) Spool d) Rem

iv) The _____ attributes is used to declare a variables based on definition of columns in a table.
a) %rowtype b) %type c) %row d) rowid

v) To compare value in control structure _____ is used.
a) = b) & c) := d) &

vi) In which control structure, no need to declare a memory variable?
a) if b) while c) for d) None of these

vii) Data stored in a cursor is known as _____.
a) implicit cursor b) Active data set c) current data set d) none of these

viii) Fetch statement retrieves _____ rows at a time.
a) one b) two c) three d) more than three

ix) In trigger to specifies correlation names, _____ key word is used.
a) referencing b) when c) for each row d) none of these

x) A _____ is Execute automatically when an associated DML statement is executed.
a) procedure b) function c) trigger d) package

Q – 2 Short Answer **attempt any ten (Each carry 2 marks)** [20]

i) Explain Break on statement of SQL reports
ii) List the functions which can be used with COMPUTE command in SQL reports.
iii) Explain TTITLE and BTITLE facility of SQL reports.
iv) Draw the control structure figure.
v) List out all operators used in PL/SQL
vi) Explain SELECT … INTO statement
vii) Explain cursor FOR Loop.
viii) List Explicit/Implicit cursor attributes.
ix) Explain in brief: SQLCODE / SQLERRM
x) What is Package? List part of package.
xi) What is trigger? List type of trigger.
xii) Different between stored Procedure and stored Function.

Q – 3 a) Explain Compute statement with example by utilizing any three functions. [06]
b) Explain how to use and remove 'Break on' Statement with example [04]

OR

Q – 3	a)	What is PL/SQL? Write it's structure and advantages	[06]
	b)	Explain column Formatting in detail with 'Column heading and 'Column Format'	[04]
Q – 4	a)	Explain Iterative and sequential control structure in details	[10]
		OR	
Q – 4	a)	Write PL/SQL Block structure and explain Conditional Control with example.	[10]
Q – 5	a)	List and explain implicit cursor attributed with suitable example.	[06]
	b)	What is exception? Write advantages of exception handling in PL/SQL.	[04]
		OR	
Q – 5	a)	List and explain explicit cursor attributed with suitable example.	[06]
	b)	Write note on pre-determined internal pl/sql exceptions, explain any one.	[04]
Q – 6	a)	Explain Procedure with syntax and example.	[06]
	b)	Explain advantage of PL/SQL Package.	[04]
		OR	
Q – 6	a)	Explain Function with syntax and example.	[06]
	b)	Explain different types of trigger in detail.	[04]

— X —

2

(28A & FA-15) Seat No.:_____ No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY
External Examination (CBCS)
B. Sc. (IT) - VIth - Semester
US06CINT02 – Web Application Development using PHP
28th March, Tuesday - 2017

Time: 10:00 am to 1:00 pm Total Marks: 70

Q-1 Select an appropriate option. 10

1. What PHP stands for?
   (a) Hypertext Preprocessor (b) Pre Hypertext Processor
   (c) Pre Hyper Processor (d) Pre Hypertext Process

2. Which of the following method sends input to a script via a URL?
   (a) GET (b) POST (c) Both (d) None

3. PHP is a widely used _____ scripting language that is especially suited for web development and can be embedded into html.
   (a) Open source general purpose (b) Proprietary general purpose
   (c) Open source special purpose (d) Proprietary special purpose

4. Which function counts elements in array?
   (a) Count (b) Sizeof (c) Array _count() (d) Both (a) and (b)

5. _____ function deletes the last element of an array.
   (a) Array_reduce() (b) Array_shift()
   (c) Array_slice() (d) Array_pop()

6. There are three different kind of array, _____.
   (a) Numeric, String, Multidimensional
   (b) Numeric, Associative, Dimensional
   (c) Numeric, Associative, Multidimensional
   (d) Const , Associative, Multidimensional

7. In php string data are delimited by_____.
   (a) Single quote (b) Double Quote
   (c) <<< identifier (d) All of above

8. Which of the following is not a session function?
   (a) Session_id() (b) Session_pw()
   (c) Session_decode() (d) Session_destroy()

9. PHP can be run on _____.
   (a) IIS (b) Apache (c) Both(a) and (b) (d) None of above

10. The _____ Function executes query on MySql database.
    (a) MySql_execute() (b) MySql_query()
    (c) MySql_result() (d) None of above

Q-2 Answer the following questions. (Attempt any **TEN**) 20

1. What is WAMP?
2. List Arithmetic Operators with appropriate example.
3. Explain if else statement in PHP.
4. What is an array in PHP? List all types of array supported in PHP.
5. Explain sort and rsort functions with example.
6. What is default argument function in PHP?
7. Explain how php session can be destroyed.
8. Explain how to delete a Cookie.
9. Explain how to check enabled cookies.
10. List different Error Handling methods.
11. Explain mysql_close () function.
12. Differentiate between char and varchar data types in MySQL.

Q-3

(a) What is PHP? Explain its advantages and disadvantages. 5

(b) Explain Break and Continue statements with example. 5

OR

Q-3

(a) List and explain the looping statements with examples. 5

(b) Explain use of GET method in PHP. 5

Q-4 What is an array? Explain numeric arrays, associative array and multidimensional array with example. 10

OR

Q-4 Explain array_combine, array_merge and array_push function with example. 10

Q-5

(a) Explain the functions: (i) chr() (ii) floor() 5

(b) What is Cookie? Explain how cookies are created and retrieved. 5

OR

Q-5

(a) Explain the functions: (i) min() (ii) date() 5

(b) What is PHP session? Explain creation and usage of session variables. 5

Q-6

(a) Explain the functions: (i) mysql_connect (ii) mysql_select_db 5

(b) Explain String data types of MySQL. 5

OR

Q-6

(a) Explain the functions: (i) mysql_query (ii) mysql_affected_rows 5

(b) Explain mysql field type with its purpose and example. 5

— X —

(2)

(45&A-15) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
B.Sc. [IT] EXAMINATION, 6th SEMESTER
Friday, 31st March, 2017
US06CINT03 [Object Oriented Programming Using Java]
Time:: 10:00 am to 1:00 pm **Maximum Marks: 70**

Q-1 Multiple Choice Question.[Each Question carries one Mark] [10]

1) Java does not support _____.
a) Operator overloading b) Global variable
c) Multiple inheritance d) All of above

2) _____ is use for naming classes, methods, variables etc in a program.
a) Operator b) Separator
c) Identifier d) Constructor

3) JVM stands for _____
a) Java Virtual Method b) Java Virtual Machine
c) Java Variable & Methods d) Java Versatile Machine

4) What keyword is used in Java to define a constant?
a) static b) final
c) abstract d) private

5) _____ is default access specifier in JAVA.
a) friendly b) private
c) protected d) public

6) We cannot create a subclass of _____ class.
a) Abstract b) public
c) static d) final

7) Which package is used for creating and implementing applets.
a) java.lang b) java.util
c) java.applet d) java.awt

8) _____ is caused by bad array indexes.
a) ArrayStoreException b) ArithmeticException
c) IOException d) ArrayIndexOutOfBoundsException

9) The _____ parameter is used to specify the applet class name.
a) classname b) code
c) name d) codebase

10) The paint method accepts _____ type of argument.
a) Graphics b) Graphic
c) Drawing d) None of these

[PTO]

Q-2 Give Answers for the following:(Any ten) [20]

1. Java is platform-independent and portable. - Justify.
2. List out the types of operators used in java.
3. Define the break and continue statements.
4. Define Inheritance. How it is created in Java?
5. Define abstract keyword.
6. Write various types of inheritance.
7. Give examples of the Run-time error.
8. Explain any two string methods.
9. Define the term – Exception and Exception Handling.
10. What is event delegation?
11. Define (1) Event (2) Event Source
12. Draw Applet Life Cycle and list out its State.

Q- 3 A) List out the decision making statements available in java. Explain any one with example. [5]

B) Describe the java environment. [5]

OR

Q- 3 A) List out the looping statements available in java. Explain any one with example. [5]

B) What is java? List features of java and explain any two in detail. [5]

Q- 4 A) Define class. How do classes help us to organize our programs? What are the three parts of a simple, empty class? [5]

B) What is a constructor? What are its special properties? [5]

OR

Q- 4 A) Describe the various forms of implementing interface. Give example of JAVA code for each case. [5]

B) Write short note on method overloading. [5]

Q- 5 A) What is exception? Explain the syntax of try block and catch block with an example. [5]

B) What is package? What are the benefits of package? Explain Java API packages. [5]

OR

Q- 5 A) Explain Reader stream classes and Writer stream classes. [5]

B) Describe the try and catch statements in detail. [5]

Q- 6 Explain Applet life cycle in detail. [10]

OR

Q- 6 Write short note on following components with example. [10]

(1) Label
(2) Button

— X —

(45&A-15) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
B.Sc. [IT] EXAMINATION, 6th SEMESTER
Friday, 31st March, 2017
US06CINT03 [Object Oriented Programming Using Java]
Time:: 10:00 am to 1:00 pm **Maximum Marks: 70**

Q-1 Multiple Choice Question.[Each Question carries one Mark] [10]

1) Java does not support _____.
a) Operator overloading b) Global variable
c) Multiple inheritance d) All of above

2) _____ is use for naming classes, methods, variables etc in a program.
a) Operator b) Separator
c) Identifier d) Constructor

3) JVM stands for _____
a) Java Virtual Method b) Java Virtual Machine
c) Java Variable & Methods d) Java Versatile Machine

4) What keyword is used in Java to define a constant?
a) static b) final
c) abstract d) private

5) _____ is default access specifier in JAVA.
a) friendly b) private
c) protected d) public

6) We cannot create a subclass of _____ class.
a) Abstract b) public
c) static d) final

7) Which package is used for creating and implementing applets.
a) java.lang b) java.util
c) java.applet d) java.awt

8) _____ is caused by bad array indexes.
a) ArrayStoreException b) ArithmeticException
c) IOException d) ArrayIndexOutOfBoundsException

9) The _____ parameter is used to specify the applet class name.
a) classname b) code
c) name d) codebase

10) The paint method accepts _____ type of argument.
a) Graphics b) Graphic
c) Drawing d) None of these

[PTO]

Q-2 Give Answers for the following:(Any ten) [20]

1. Java is platform-independent and portable. - Justify.
2. List out the types of operators used in java.
3. Define the break and continue statements.
4. Define Inheritance. How it is created in Java?
5. Define abstract keyword.
6. Write various types of inheritance.
7. Give examples of the Run-time error.
8. Explain any two string methods.
9. Define the term – Exception and Exception Handling.
10. What is event delegation?
11. Define (1) Event (2) Event Source
12. Draw Applet Life Cycle and list out its State.

Q- 3 A) List out the decision making statements available in java. Explain any one with example. [5]

B) Describe the java environment. [5]

OR

Q- 3 A) List out the looping statements available in java. Explain any one with example. [5]

B) What is java? List features of java and explain any two in detail. [5]

Q- 4 A) Define class. How do classes help us to organize our programs? What are the three parts of a simple, empty class? [5]

B) What is a constructor? What are its special properties? [5]

OR

Q- 4 A) Describe the various forms of implementing interface. Give example of JAVA code for each case. [5]

B) Write short note on method overloading. [5]

Q- 5 A) What is exception? Explain the syntax of try block and catch block with an example. [5]

B) What is package? What are the benefits of package? Explain Java API packages. [5]

OR

Q- 5 A) Explain Reader stream classes and Writer stream classes. [5]

B) Describe the try and catch statements in detail. [5]

Q- 6 Explain Applet life cycle in detail. [10]

OR

Q- 6 Write short note on following components with example. [10]

(1) Label
(2) Button

— X —

[458A14] **SEAT No._____** No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

Bsc(INT) Examination, 6th Semester

Monday, 3rd April, 2017.

Time: 10:00 A.M to 01:00 P.M **Subject Code: US06CINT04**

Subject: Software Project Management **Total Marks:70**

Q.1 Multiple Choice Questions. **10**

1 _____Represents how well the product satisfies the customer.

A. Cost C. Quality

B. Schedule D. All of above.

2 CMM stands for _____ .

A. Common metrics model C. Capable mature model

B. Case monitoring Model D. Capability maturity model

3 Which is not a part of Process Architecture ?

A. Process C. stages

B. Activities D. None of above

4 Change Requirement can be classified as_____.

A. Minor C. Both A & B

B. Major D. None of above

5 _____ gives a logical structure to the user's view of the data in the system

A. Function C. Data model

B. Process Model D. None of above

6 _____describes the data stores, processes, and external entities in data-flow diagrams

A. DFD C. Data model

B. E-R diagram D. Data Dictionary

7 _____ activity focuses on enumerating possible risks-to the project.

A. Risk identification C. Risk Assessment

B. Risk prioritization D. None Of Above

8 _____are probably the most common technique for risk identification.

A. Data collection C. Checklists

B. Interviews D. Surveys

9 Which one of the following is not a stage of Review process?

A. Planning C. Rework & Follow-up

B. Group review meeting D. Auditing

10 _____lists the actual defect found

A. Group review meeting log C. Summary report

B. self-preparation log D. Analysis log

P.T.O

Q.2 **Answer the following questions in short. (Any 10)** 20

1) List out reasons for project failure.
2) What is process?
3) What is Contract ? In Which situation letter of intent will be given ?
4) Draw a diagram of process for requirement analysis & Specification.
5) List out the phases involved in development process.
6) Give examples of Process matrices & Product matrices
7) What is procedural Approach ?
8) What is Risk Assessment?
9) What are the general rules to controlling changes to Document?
10) What is Project tracking?
11) List out the documents & artifacts achieved in Archiving
12) List out major activities involved in the planning phase?

Q.3(A) Describe goals for KPAs at Level 3(Defined). 06
(B) Write note Documentation. 04

OR

Q.3(A) Describe goals for KPAs at Level 2(Repeatable) 06
(B) Write a note on The Proposal. 04

Q.4 What is Development Process? Explain it with diagram & list out phases of it. 10

OR

Q.4 Describe in brief overall Process of Requirements Analysis & Specification. 10

Q.5(A) Explains in detail Risk Assessment. 06
(B) Write a note on Procedural approach to Quality management. 04

OR

Q.5(A) Explain in brief Quality management. 06
(B) Write a note on Software quality & Defect. 04

Q.6(A) Describe in brief Project Tracking. 06
(B) Write a note on Auditing 04

OR

Q.6(A) Describe in brief Review process. 06
(B) Write a note on follow –up. 04

No. of Printed Pages : 2

SEAT No._____

[21A]

SARDAR PATEL UNIVERSITY
T.Y.B.Sc : SEMESTER – VI
INFORMATION TECHNOLOGY
US06CINT05: Information Security

Date: 08-04-2017 **Time: 10:00am to 01:00pm** **Max. Marks: 70**

Q.1 Multiple choice of Question: **10**

[1] _____ is the original message or data that is involved into the algorithm as input.
a) Plaintext b) Simpletext
c) Ciphertext d) None of these

[2] A _____ cipher replaces one symbol with another.
a) Monographic b) Substitution
c) Transposition d) None of these

[3] A transposition cipher _____ symbols in a block of symbols.
a) Re permutes b) Subtract
c) Permutes d) None of these

[4] The full form of CBC is _____
a) Chaining Block Cipher b) Cipher Block Chaining
c) Chipher Bookcode d) None of these

[5] DES stands for _____
a) Data Encryption Standard b) Data Encryption Scheme
c) Data Encryption System d) None of these

[6] _____ is not authorized person to use the computer.
a) Masquerader b) Misfeasor
c) Clandestine user d) None of these

[7] MAC stands for _____
a) modification authentication code
b) modification authorized code
c) message authentication code
d) None of these

[8] A _____ can use a pair of asymmetric keys.
a) message integrity b) message authentication
c) digital signature d) None of these

[9] In _____ IPSec protects the original IP header.
a) Active mode b) Tunnel mode
c) Transport mode d) None of these

[10] The _____ protocol provides security at the application layer.
a) Pretty Good Privacy c) SSL/TLS
b) IPSec d) None of these

(PTO)

Q.2	**Answer the following questions in short (Any 10) :**	20
	[1] Define the terms: PlainText, Cryptanalysis.	
	[2] Define system services. Also write down its categories.	
	[3] List the fundamental principles of cryptography.	
	[4] Define: Trojan Horse and Logic Bomb	
	[5] Define: Backdoor and Trap Door	
	[6] Write a difference between DES and AES.	
	[7] How HMAC is generated?	
	[8] List the various ways for public key distribution.	
	[9] Draw the diagram for creation of MAC.	
	[10] Explain IPSec protocol in brief.	
	[11] Write a difference between SSL vs. TLS.	
	[12] Draw the diagram for tunnel mode.	
Q.3	[A] Explain substitution cipher in detail.	5
	[B] Explain transposition cipher in detail.	5
	OR	
Q.3	Write a detail note on Security Attack.	10
Q.4	[A] Explain Virus Structure in detail.	5
	[B] Explain application for public key cryptosystem.	5
	OR	
Q.4	[A] Write a detail note on Data Encryption Standard.	5
	[B] Explain different cipher modes in detail.	5
Q.5	[A] Write a detail note on Message authentication.	5
	[B] Explain various attacks performed on password.	5
	OR	
Q.5	Explain entity authentication methods in detail.	10
Q.6	Explain in detail the types of firewall.	10
	OR	
Q.6	[A] Explain various services performed by SSL.	5
	[B] Explain Encapsulating Security Payload protocol in detail.	5

—x—

SEAT No._____

No of printed pages:2

[30?A13]

SARDAR PATEL UNIVERSITY
B.Sc. [IT] EXAMINATION, 6th SEMESTER
Friday, 7th April, 2017

US06CINT06[Data Communication and Networking]

Time::10:00 a.m. to 1:00 p.m. **Maximum Marks: 70**

Q-1 Multiple Choice Question.[Each Question carries one Mark] [10]

1) If a computer on the network shares resources for others to use, it is called _____.
   a) Server b) Client
   c) Mainframe d) Router

2) A _____ is a data communication system spanning states, countries, or the whole world.
   a) MAN b) LAN
   c) WAN d) None of above

3) Traditional LANs run at speeds of _____ to _____ Mbps.
   a) 20 to 100 b) 10 to 1000
   c) 100 to 1000 d) 10 to 100

4) Which of the following physical connection is the fastest?
   a) Twisted pair b) Coaxial cable
   c) Fiber-optic cable d) Radio waves

5) _____ Cable can carry signals of higher frequency ranges than _____ cable.
   a) Twisted-pair; fiber-optic b) Coaxial; fiber-optic
   c) Coaxial; twisted-pair d) None of the above

6) A _____ is a set of rules that govern data communications.
   a) Layers b) Network
   c) Protocol d) Communication

7) Bit synchronization is responsibility of _____.
   a) Data link layer b) Network layer
   c) Session layer d) Physical layer

8) _____ topology requires multipoint connection.
   a) Star b) Bus
   c) Tree d) None of these

9) A router operates at _____ layer.
   a) Physical b) Data link
   c) Network d) Transport

10 An artificial satellite needs to have _____ which is the path in which it travels around the Earth.
   a) Channel b) Tower
   c) Communication lines d) Orbit

[PTO]

Q-2 Give Answers for the following:(Any ten) [20]

1. Define computer networks.
2. Define: Topology and Data rate.
3. What are the uses of computer networks?
4. List various categories of Coaxial cable and state their use.
5. Explain parallel transmission in brief.
6. What is modulation? List various modulation techniques.
7. List main responsibilities of following layers.
   A. Presentation Layer B. Application Layer
8. What are the advantages of bus topology over mesh topology?
9. What is satellite? List categories of satellite.
10. What is the difference between bridge and repeater?
11. Write a short note on Repeater.
12. Write a short note on Amplifier.

Q - 3 A) Explain categories of computer network in detail. [5]
B) Explain Wide Area Network in detail. [5]

OR

Q - 3 A) Discuss the advantages of computer network. [5]
B) Explain MAN in detail. [5]

Q - 4 A) Discuss in detail fiber optics transmission media and its advantages. [5]
B) What is switching? Explain packet switching in detail. [5]

OR

Q - 4 A) Explain Asynchronous transmission in detail. [5]
B) Explain FDM in detail. [5]

Q - 5 Explain OSI reference model in detail. [10]

OR

Q - 5 Explain following topology with their advantages & disadvantages. [10]
(1) Star (2) Mesh

[5]

Q - 6 A) Explain working of router. [5]
B) Write a note on geosynchronous satellite. [5]

OR

Q - 6 A) Write a short note on CSMA. [5]
B) Write a note on communication satellite. [5]

— X —

(49 & A-95) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. Sixth semester

Instrumentation (Vocational)

US06CINV01

Process Measurement Techniques-2

Monday, 27/03/2017

Time: - 10:00 AM To 1:00 PM **Marks: - 70**

Q.1 Choose the correct answer (Attempt all) **(10)**

(1) Which of the following utilizes U tube manometer for level measurement?
- (a) Open vessels.
- (b) Interface level.
- (c) Pressure vessels.
- (d) None of above.

(2) In which of the following method remote readout is not possible?
- (a) Float and tape.
- (b) Sight glass.
- (c) Float and Shaft.
- (d) All of above.

(3) The density of the lubricant oil is _____the density of water.
- (a) More than.
- (b) Equal to.
- (c) Less than.
- (d) None of above

(4) Which of following can be measured by Psychrometer?
- (a) Relative flow.
- (b) Relative Humidity.
- (c) Relative pressure.
- (d) All of above.

(5) Which of following is non destructive method of moisture measurement?
- (a) Thermal Drying.
- (b) Distillation.
- (c) Electrical conductivity.
- (d) All of above.

(6) How cooling is obtained typically in a laboratory type dew point apparatus?
- (a) Air coolers.
- (b) Water chillers.
- (c) Blowing air in coolant.
- (d) Cryogenic cooling.

(7) Among the following which is the flow rate meter?
- (a) Nutating disk meter.
- (b) Rotating vane meter.
- (c) Venturi meter.
- (d) Lobed impeller meter.

(8) Pitot-static tube measures:_____
- (a) Static Pressure.
- (b) Total Pressure.
- (c) Dynamic Pressure.
- (d) None.

(9) In which type of flow meter an eccentric drum is required?
- (a) Lobed impeller meter.
- (b) Titling trap meter.
- (c) Rotary vane meter.
- (d) Hot wire meter.

(10) The emf produced by electromagnetic flow meter is function of ____
- (a) Dynamic pressure.
- (b) Flow velocity.
- (c) Discharge.
- (d) None.

(1) (P.T.O.)

Q2 **Answer the following questions (Any Ten)** (20)

(1) Give the name of quantities which can be estimated by measuring the level of liquid in the tank.

(2) Explain how pressure gauge can be used to measure level of liquid in tank?

(3) Define density and list method of density measurement.

(4) Discuss the relationship between time and temperature in the thermal drying method of moisture measurement.

(5) List the limitations of the thermal drying method and explain how they can be overcome.

(6) Explain principle of simple dew point measuring device.

(7) Write Bernoulli's expression relating pressure and velocity of fluids.

(8) Explain the need for the converging and diverging cone in venturi flow meter

(9) List the factor that governs the flow of fluids in closed pipes.

(10) Discuss the principle of hot wire anemometer type flow meter.

(11) Explain how the flow of liquid is measured in open channels.

(12) Differentiate the continuous type and quantity type flow meters.

Q3 Explain in detail bubbler method for measurement of liquid level and Density. (10)

OR

Q3 Write a note on Electrical Resistance and Capacitance type methods of liquid level measurement. (10)

Q4 With necessary diagram explain working of automatic electronic Psychrometer. (10)

OR

Q4 Draw the schematic diagram of the Industrial dew point apparatus and explain it briefly. (10)

Q5 Draw the sketch of various types of Orifice and discuss Orifice meter in detail. Mention its advantages and disadvantages. (10)

OR

Q5 Derive an equation for Flow rate of incompressible fluid in closed pipe. (10)

Q6 Explain Titling trap method and Nutating disk method for flow measurement. (10)

OR

Q6 Explain Electro-magnetic flow meter and list its advantages and disadvantages. (10)

— X —

(2)

(29 A&A-25) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. (6TH Sem) Examination - March/April 2017 [CBCS]

28th March, 2017, Tuesday

10:00 AM to 01:00 PM

US06CINV02 (Instrumentation - Vocational)

Control Technique - II

Maximum Marks: 70

Que 1 Each question below gives a multiple choice of answers. Choose the most appropriate one. [10]

1 _____: is Given By the Low and High Values of the Provess Variable that is Measured.

a) Range b) Span

c) Zero d) None of These

2 _____: is the Low Value of the Range which does not have to be Zero in Order to be Called the Zero of the Instrument.

a) Controlled Variable b) Range

c) Manipulated Variable d) None of These

3 _____: The Input has no Control Over the Output (Controlled Variable).

a) Closed - Loop Control System b) Feedforward Control System

c) Cascade Control System d) None of These

4 The Programmer Unit of Programmable Logic Controller (PLC) Provides an Interface Between the PLC and the User During _____.

a) Program Development b) Troubleshooting

c) Both a) and b) d) None of These

5 _____: is the Liaison Between What the PLC Understands and What the Engineer Desires to Perform During the Control Sequence.

a) Real - Time CPU b) Input/Output (I/O) System

c) Both a) and B) d) None of These

6 The Use and Understanding of PLC Programming Depends on the _____.

a) Knowledge of the Process to be Controlled b) Understanding of Electrical Schematics

c) Both a) and b) d) None of These

7 _____: Capability Allows a Picture to be Drawn on the Screen so that the Operator can Look at a Portion of the Process More Realistically than by Watching a Row of Bar Graphs.

a) Detail Displays b) Trend Dispalys

c) Overview Displays d) None of These

8 _____: is Specific to a Single Loop or Control Function.

a) Overview Display b) Graphic Display

c) Trend Display d) None of These

9 _____: Fraction of the Total Interval that is not Performing to Specification, i.e. Failed or Down.

a) Mean Time to Fail b) Availability

c) Mean Failure Rate d) None of These

10 _____: is the Testing of Each Instrument for Correct Calibration and Operation Prior to its Being Installed in the Field.

a) Pre - Installation Testing b) Loop Testing

c) Piping and Cable Testing d) None of These

(P.T.O.)

Que 2 **Short Questions (Attempt any TEN)** **[20]**

1. Give Block Diagram Representation of an Industrial Process Control System.
2. Enlist the Components of a Process Control System.
3. Explain Briefly Sensors and Transmitters.
4. Enlist Components of Microcomputer.
5. Differentiate: Personal Computer (PC) and Programmable Logic Controller (PLC).
6. Give an Account of Memory Unit of PLC.
7. Differentiate: Programmable Logic Controller (PLC) and Distributed Control System (DCS).
8. Explain Briefly Graphic Display.
9. Enlist features of DCS.
10. Define: Mean Up - Time Between Failure (MTBF).
11. Define: Availability (A).
12. Define: Mean Down Time (MDT).

Que 3 **[A]** Write a note on Feedforward Control System. State its Disadvantages. **[05]**

[B] Explain Event - Driven Sequential Control System. **[05]**

OR

[C] Write a note on Open - Loop Control System. State its Advantages and Disadvantages. **[05]**

[D] Give an account of Numerical Control System. **[05]**

Que 4 **[A]** Discuss Basic Structure of a PLC with Necessary Diagram. **[05]**

[B] Write a Note on Input/Output (I/O) System of PLC. **[05]**

OR

[C] Write on I/O Quantity and Type & I/O Remoting Requirements of PLC. **[05]**

[D] Discuss PLC Programming in detail. **[05]**

Que 5 **[A]** Explain Information Dispalys of DCS with Necessary Diagrams. **[10]**

OR

[B] Write a Note on DCS Supervisory Computer Tasks. **[10]**

Que 6 **[A]** Write a note on Pre - Installation Testing and Pre - Commissioning. **[05]**

[B] Explain Piping and Cable Testing & Plant Commissioning. **[05]**

OR

[C] Give an account of Total Lifetime Operating Cost of Measurement System. **[05]**

[D] Write a note on Cabling. **[05]**

— X —

(46 & A-24) SEAT No._____ No. of Printed Pages : 2

SARDARPATEL UNIVERSITY

T.Y B.Sc. Semester-VI[th] EXAMINATION

SUB. CODE:-US06CINV03 CONTROL ROOM INSTRUMENTATION

DATE:-31/03/2017, Friday TIME :- 10:00 am to 1:00 pm MARKS-70

Q-1 Choose correct answer [10]

1. Annunciator used for field instrument is _____.
   (A) Semigraphic annunciator (C) Vocal annunciator
   (B) Relay type annunciator (D) Integrator annunciator
2. To generate A.C. power without battery backup _____ is used.
   (A) UPS (C) UVS
   (B) Both (A) & (C) (D) None of these
3. Which of the following control panel is most easy to construct ?
   (A) Front break (C) Flat
   (B) Console (D) All of above
4. High density case instruments are of _____ dimensions.
   (A) 18' × 24' (C) 6' × 6'
   (B) 6' × 2' (D) 12' × 6'
5. Group A NEMA standard represents hazard due to _____.
   (A) Metal dust (C) Hydrogen
   (B) Acetelene (D) Carbon black
6. Which of the following transfer mode is fastest ?
   (A) Multicycle (C) No break
   (B) Sub-cycle (D) All are of same speed
7. Which type of indicator is used to show the state of parameter ?
   (A) Moving scale (C) Galvanometric
   (B) Parametric (D) Fixed scale
8. Which of the following is not a type of workstation ?
   (A) Engineer's (C) Operator's
   (B) Portable (D) Administrative
9. Pneumatic annunciators are designed using _____.
   (A) Transistors (C) Relays
   (B) Pneumatic devices (D) All are true
10. Class III panel wiring stands for combustible material in form of
    (A) Dust (C) Gas
    (B) Fibers (D) All of above

Q-2 Short answer type question. (any ten) [20]

1. Briefly explain bus transfer switch.
2. Briefly describe vocal annunciator.
3. Write down different types of panel instruments.
4. Explain the function of ACK button on annunciator panel.
5. Write different reasons of power failure.
6. Enlist different system components of UPS.
7. Briefly explain strip chart recorders.
8. Give the advantages and disadvantages of plastic as panel material.
9. Compare UPS with UVS.
10. Describe TEST and REPEATER feature in annunciator.
11. Write a short note on high density instruments.
12. Briefly explain uninterruptible voltage supply.

(P.T.O.)

Q.3	Discuss operational principle of annunciator system.	[10]
	OR	
Q.3	Explain the role of test and acknowledgement buttons on annunciator panel.	[10]
Q.4 (A)	Write a note on traditional control rooms.	[04]
Q.4 (B)	Explain panel wiring and tubing.	[06]
	OR	
Q.4 (A)	Give an account of graphic panels.	[06]
Q.4 (B)	Describe panel material of construction.	[04]
Q.5	Enlist system components of UPS. Discuss rotary equipements and batteries for UPS.	[10]
	OR	
Q.5	Give a detailed account on power failure classification.	[10]
Q.6 (A)	Write a detailed note on movable scale indicators.	[05]
Q.6 (B)	With the help of neat diagrams explain potentiometric recorder.	[05]
	OR	
Q.6 (A)	Draw the diagram of light beam recorder and explain its working.	[10]

----------*BEST OF LUCK*----------

SEAT No._____

No. of Printed pages: 2

[4628243]

SARDAR PATEL UNIVERSITY

APRIL-2017

T. Y. B. Sc. Examination (CBCS) VI Sem

US06CINV04 – Spectroscopy & Biomedical Instrumentation

3rd April, 2017, Time:10: 00 am to 1:00pm

Total Marks: 70

Note: The figures to the right indicate maximum marks.

Q-1. ***Multiple Choice Questions-*** [10]

(1) $m\lambda = 2 * d * n * \sin\theta$, where d is .....

(a) length (b) number (c) refractive index (d) distance

(2) The wavelength of ultraviolet light is

(a) below 300nm (b) from 300nm to 500nm (c) above 600nm (d) none of these

(3) $E = h\nu$, E represents.....

(a) wavelength (b) velocity (c) energy (d) frequency

(4) The most commonly used window material in IR range is

(a) NaCl (b) CO_2 (c) BaF (d) SiGe

(5) Mull technique for sample handling in IR spectroscopy is used for.....

(a) liquid (b) solid (c) gas (d) all

(6) Tungsten lamp emits light in the ..... range.

(a) X-ray (b) Visible (c) Microwave (d) Cosmic

(7) The measurement of Glavanic skin resistance is example of ..... signal

(a) biochemical (b) bioimpedance (c) bio-optical (d) bioelectric

(8) EEG is common example of ..... signal.

(a) bioacoustic (b) biochemical (c) bio-optical (d) bioelectric

(9) Information regarding relative cell size is obtained by

(a) centrifuge (b) coulter counter (c) inhibitor (d) none

(10) If the thermocouple is made up of Copper-Constantan, it is of ..... type.

(a) J (b) K (c) T (d) S

Q-2. ***Short answer type (attempt any ten)*** [20]

(1) Write Beer's law.

(2) What type of Instrument related errors occur in Spectrometer?

(3) List different types of detectors used in UV- VIS spectrometer.

(4) What are the limitations of Photomultiplier tube?

(5) What is Bolometer?

(6) What is Littrow mounting infrared monochromator?

(PTO)

(7) What are the advantages of Thermistor?

(8) List the materials used for prism construction.

(9) State empirical laws to accurately measure temperature by thermoelectric means.

(10) What do you understand by systolic and diastolic pressure?

(11) What is the function of stimulators used in EMG machines?

(12) What is the use of needle electrodes?

Q-3. (a) Describe double beam filter photometer. [5]

(b) Write a note on Photovoltaic cells. [5]

OR

Q-3. (a) Draw block diagram of Absorption Instrument and explain each block briefly. [5]

(b) Write a note on prism and grating. [5]

Q-4. (a) Draw optical arrangement diagram of IR spectrometer and explain. [5]

(b) With block diagram explain Optical Null type double beam Infrared spectrophotometer. [5]

OR

Q-4. (a) Explain Golay's Pneumatic Cell and Pyroelectric detector used in IR spectroscopy. [5]

(b) Discuss IR Radiation sources. [5]

Q-5. (a) Explain Medical Instrument System with different biomedical sources. [5]

(b) Explain with neat block diagram principle of ECG machine. [5]

OR

Q-5. Discuss the basic principle of Bio-potential generation with sequential figures and PQRS complex graph. Also define the terms: Resting Potential and Action Potential. [10]

Q-6. (a) Discuss types of Sphygmomanometer in brief. [5]

(b) Discuss in brief types of Optical Fiber Sensors. [5]

OR

Q-6. (a) Explain principle of Coulter counter. [5]

(b) List errors in electronic counter. [5]

****

SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY V.V.NAGAR

[22A]

B.Sc. (VIth SEM.) INSTRUMENTATION(VOC.)
APRIL-2017 EXAMINATION
8-BIT MICROPROCESSOR PROGRAMMING
SUB.CODE-US06CINV05

DATE:-08/04/2017 TIME:-10:00 am to 1:00 pm MARKS-70

Q-1 Choose correct answer **[10]**

1. The decimal equivalent of FB_H is _____.
   (A) 253 (C) 235
   (B) 531 (D) none of above
2. _____ is unconditional jump instruction.
   (A) JNC (C) JMP 2010
   (B) JNZ (D) none of above
3. A down counter counts in _____ order.
   (A) ascending (C) both A and B
   (B) descending (D) none of above
4. RET is _____ instruction.
   (A) one byte (C) three byte
   (B) two byte (D) none of above
5. Rotate accumulator right instruction is _____.
   (A) RAR (C) RLC
   (B) RAL (D) none of above
6. Maximum time delay using single register program is _____.
   (A) 10 ms (C) 1.8 ms
   (B) 2.8 sec (D) none of above
7. Counter program is used to _____.
   (A) counting (C) stacking
   (B) masking (D) none of above
8. If accumulator (A) =39 H, after execution of ANI F0 H, the contain of accumulator is_____.
   (A) 30 H (C) 03 H
   (B) 39 H (D) none of above
9. To set the carry flag _____ instruction is used.
   (A) STC (C) CMC
   (B) PCHL (D) none of above
10. To design counter and time delays_____ and ____ techniques are used.
    (A) looping, counting (C) debugging, indexing
    (B) nesting ,subroutine (D) none of above

Q-2 Short answer type question. (any ten) **[20]**

1. Briefly explain EI and DI.
2. Draw the flow chart of counter and time delay using single register.
3. Define T-state in 8085 µp.
4. Briefly explain ASCII code.
5. Which instructions are used to store and retrieve data from STACK?
6. List arithmetic instruction related to memory in 8085 µp.
7. Define : (1) counter (2) time delay
8. Define RAL and RLC instruction.
9. What do you mean by debugging in 8085 µp?
10. What is subroutine? state its instructions
11. Write a program to load 4C H in register D, multiply 4C H by 2 using rotate instruction, and specify the result.
12. How many ways we can reset the flip-flops in interrupt process?

(PTO)

Q.3 A 15 byte of data stored in memory location starting at XX50 H. Write a program to add all these data bytes and save the carry generated in register. Display the sum at output PORT. **[10]**

OR

Q.3 (A) Explain compare instruction with illustration. **[5]**
(B) Explain rotate instruction with illustration. **[5]**

Q.4 Discuss different conditional and unconditional CALL and RET instructions of 8085 system with necessary illustration. **[10]**

OR

Q.4 Write a program to count continuously in hexadecimal from CD H to 00 H in a system with 2 MHz clock frequency. Set up a time delay of 2.8 ms between each count and display the count at one of the output PORT. (Take no. Of loop T-state = 14). **[10]**

Q.5 Write a programme to convert two digit BCD number stored in memory location to its equivalent binary number. **[10]**

OR

Q.5 Write a programme to convert two digit BINARY numbers stored in memory location to its equivalent BCD number. **[10]**

Q.6 A set of Ten pack BCD number is stored in memory location stating at XX20 H. Write a program with subroutine to add all these numbers in BCD if carry is generated save it in register B after adjusting it for BCD. **[10]**

OR

Q.6 Explain LHLD, ADC M, DAD Rp, XTHL ,CMC **[10]**

— X —

(50 & A-27) Seat No:_____ No. of printed pages: (02)

SARDAR PATEL UNIVERSITY

B.Sc (CBCS) Examination, VI Semester

Monday, Date: 27/03/2017

Session: Morning, Time: 10:00 a.m. to 1:00 p.m.

Subject Code: US06CMIC01, Subject: Microbial Genetics

Total marks: 70

Q.1. Answer the following multiple choice questions (10)

1. When a purine base is replaced by pyrimidine base or vice versa, it is known as.....mutation.
   a) Transversion b) Transition c) Transduction d) Transformation

2. ..... is an example of nitrogen base analogue.
   a) EMS b) 2-Aminopurine c) U. V. rays d) None of these

3. Auxotrophs can grow on .....
   a) Complete medium b) Minimal medium c) both (a) and (b) d) None of them

4. Photoreactivation repairs the DNA damaged by .....
   a) UV rays b) Base analogues c) Alkylating agents d) All of the above

5. Holiday junction cleavage is carried out by .....
   a) Ruv A b) Ruv B c) Ruv C d) None of these

6. Ames test to detect mutagenicity and carcinogenicity was discovered by .....
   a) John Ames b) Kenny Ames c) Bruce Ames d) None of these

7. The state of cells in which transformation can occur is known us.....
   a) Replication b) Transversion c) Competence d) Conversion

8. Transfer of DNA from one bacterial cell to another through bacteriophage is known as.....
   a) Transformation b) Transduction c) Conjugation d) Translation

9. Plasmid that carry genes for antibiotic resistance is known as.....
   a) Col plasmid b) Metabolic plasmid c) F plasmid d) R plasmid

10. Hfr strains means..... strains
    a) High frequency recombination b) High frequency replication
    c) High frequency repair d) All of the above.

(P.T.O.)

Q.2 Answer the following: (any 10) (20)

1. Explain Frame shift mutation.
2. Explain the mutation caused by 5-bromo uracil with suitable diagram.
3. Define: Transition and Transversion mutation.
4. Write Photoreactivation repair.
5. What is mismatch repair?
6. Explain non homologous recombination.
7. Explain transformation in *Haemophilus influenzae* in brief.
8. What are IS elements?
9. Write about generalized transduction.
10. Draw a neat and labeled diagram of F plasmid.
11. Write general characteristics of plasmid.
12. Define: a) Plasmid b) Conjugation

Q.3 Describe in detail the fluctuation test to prove that mutation is spontaneous. (10)

OR

Q.3a) Enlist the types of chemical mutagenic agents. Describe the mechanism of mutation by EMS. (06)

Q.3b) Explain the method of isolation of auxotrophs. (04)

Q.4a) Explain AMES test for carcinogenicity and mutagenicity in detail. (07)

Q.4b) Explain mutation caused by U.V. rays. (03)

OR

Q.4a) Describe Holiday Model of recombination. (06)

Q.4b) Explain SOS repair. (04)

Q.5a) Explain the mechanism of transformation in *Streptococcus pneumoaniae*. (05)

Q.5b) Describe the discovery of transformation. (05)

OR

Q.5a) Explain specialized transduction with suitable example. (05)

Q.5b) Write the mechanism of Tn3 transposition. (05)

Q.6a) Explain conjugation process between Hfr strains and F⁻ cells with diagram. (06)

Q.6b) Write a note on Col plasmid. (04)

OR

Q.6a) Describe U tube experiment for conjugation. (06)

Q.6b) Explain why bacteria are the most suitable organisms as genetic tools. (04)

— X —

(30 A & A-27) Seat No.:_____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

T. Y. B.Sc. (VI Sem) Examination - 2017[CBCS]

TUESDAY, 28 March, 2017

10:00AM - 1:00 PM

US06CMIC02(MICROBIOLOGY)

TOOLS AND TECHNIQUES IN MOLECULAR BIOLOGY

Maximum Marks: 70

Q.1. Each question below gives a multiple choice of answers. Choose the most appropriate one. [10]

1 Restriction sites of type II enzymes:

(a)generally are palindromic sequences (b) consists of 4-6 bp

(c) mostly are palindromes with rotational symmetry (d) All of these

2 A method of DNA sequencing in which DNA threads are chemically cut into pieces of different size is_____

(a) Sanger's Method (b) Maxam-Gilbert Method

(c) Hamilton's Method (d) Vortex method

3 DNA ligase used in recombinant DNA technology is obtained from:

(a) *E.coli* (b) *E.coli* & T4 phage

(c) *Saccharomyces cerevisiae* (d) Retroviruses

4 Vectors designed to replicate cells of two different spp. are called

(a) Shuttle vectors (b) Expression vectors

(c) Phasmid (d) None of these

5 Plasmids which are maintained as a limited number of copies per cell are known as_____

(a) Stringent plasmids (b) Cryptic plasmids

(c) Relaxed plasmids (d)All of these

6 Cosmid is a plasmid with

(a) minimum of 250 bp of □ DNA that includes a Cos site (b) minimum of 250bp of M13 DNA that includes Cos site

(c) minimum of 100 bp of □ phage DNA includes a Cos site (d) minimum of 250 bp of T4 phage DNA includes a Cos site

7 Some of the steps involved in fingerprinting are listed below: (i) Extraction of DNA; (ii) Collecting the sample (iii) Treating DNA with restriction enzymes (iv)Gel electrophoresis (v) Transfer segments of DNA to nitrocellulose membrane (vi) Hybridize with probe (vii) Autoradiography

(a) ii,i,iii,iv,v,vi,vii (b) vii,v,iv,ii,i,iii,vi

(c) i,ii,iii,iv,v,vi,vii (d) ii,i,iv,iii,v,vii,vi

8 Which is not a step in the blotting procedure?

(a) Transfer of the DNA fragments to nitro cellulose membranes (b) Ligation of the DNA fragments on a gel

(c) Hybridization of the membrane with a labelled probe (d) Ligation of the DNA into a vector

9 Codominant marker such as RFLP are useful for:

(a) Marker assisted selection (b) Evolutionary studies

(c) Linkage mapping (d) All of these

(P.T.O.)

10 DNA polymerase of *T. aquaticus* is preferred to that of *E.coli* in PCR because:

(a) It replicates DNA more efficiently (b) It does not require primers

(c) It is not denatured at the temperature at which the DNA strands are separated (d) It does not cause errors in replication

Q. 2 Short Questions (Attempt any TEN) **[20]**

1 What are isoschizomers and give its example.
2 Define Linker and Adaptor.
3 Why is the Sanger technique of DNA sequencing also called as chain termination method?
4 Enlist the properties of host.
5 What essential feature should plasmid possess as a suitable cloning vector?
6 What is multiple cloning site(MCS) and what is its significance.
7 Explain blue and white selection method for the selection/screening of recombinants.
8 Which technique identifies protein binding site on a DNA molecule and give its application.
9 What is transfection and Electroporation?
10 What are the applications of microarray?
11 What is RAPD and where it can be used?
12 Differentiate between radioactive and nonradioactive probe.

Q. 3 [A] Explain isolation of DNA giving role of each chemical used. **[05]**
[B] Explain ligation in detail. **[05]**

OR

Q. 3 [A] What is chemical degradation method of DNA sequencing? Explain **[04]**
[B] Why Restriction enzymes are called molecular scissors and explain the properties of Type I, II and III restriction enzymes. **[06]**

Q. 4 [A] What are artificial chromosomes? And explain BAC and YAC **[07]**
[B] Write a note on phasmid **[03]**

OR

Q. 4 Define vector. How do you differentiate between cloning and expression vector and explain cosmid and PUC 18 vectors. **[10]**

Q. 5 [A] Write a note on Colony hybridization **[04]**
[B] Explain transformation and particle gun **[06]**

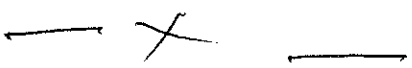
OR

Q. 5 Explain in detail Southern hybridization and how does it differ from Northern hybridization **[10]**

Q. 6 Explain in detail protein sequencing **[10]**

OR

Q. 6 Write a detailed note on PCR stating its principle, procedure, applications, advantages and limitations **[10]**



(47 & A-26) SEAT No._____ No. of Printed Pages : 3

SARDAR PATEL UNIVERSITY

SEMESTER-VI

B.Sc. EXAMINATION (MICROBIOLOGY)

US06CMIC03

(Microbial Biochemistry)

Date: 31/03/2017 Time:10 :00 a.m. to 1:00 p.m.

Day : Friday Total marks: 70

N.B: Figures on the right indicate marks.

Q.1 Select the correct answer for each question from the given (10) options.

1 In ATPase complex I, III and IV act as _____.
(a) protonmotive force (b) proton pump
(c) active pump (d) passive pump

2 Calvin cycle is operated in _____.
(a) *S.aureus* (b) *B.subtilis*
(c) *E.coli* (d) *Rhodosirillum rubrum*

3 β-chains of F_1 has_____sites.
(a) catalytic (b) allosteric
(c) passive (d) zymogen

4 How many ATPs are generated per one turn of TCA Cycle?
(a) 12.5 (b) 11.5
(c) 10.5 (d) 15

5 Nucleoside transphosphorylation achieved during_____is converted to succinic acid.
(a) Acetyl CoA (b) Succinyl CoA
(c) Propionyl CoA (d) Butyryl CoA

6 _____will inhibit 1,3PGA---------→3PGA reaction.
(a) Fluoride (b) Chloride
(c) Arsenite (d) Copper

7 Complete β-oxidation of one molecule of Palmitoyl CoA yields_____H_2O.

(a) 108 (b) 180

(c) 118 (d) 123

8 _____is a poly unsaturated fatty acid.

(a) Archidonic acid (b) Acetyl COA

(c) Oleoyl COA (d) Melonyl COA

9 _____inhibit the anthranilate synthase enzyme.

(a) Tyrosine (b) Lysine

(c) Phenylalanine (d) Tryptophan

10 In Urea Cycle, one amino group is derived from ammonia, while second ammonia group is derived from_____.

(a) Glutamic acid (b) Aspartate

(c) Arginine (d) Lysine

Q.2 Give short answers to the following questions. (02 - marks each) (20) (Any Ten)

1 Explain:auxotroph and Secondary metabolism.

2 Describe the organization of ETC.

3 Describe chemical composition of F1 subunit of ATP Synthase.

4 Explain three irreversible reactions involved in gluconeogenesis.

6 Give nanes of three enzymes and five co-enzymes required by PDH complex.

7 Explain reaction where role of Acetyl CoA carboxylase is involved.

8 Define:α-Oxidation and ώ-Oxidation of fatty acid.

9 What are the major differences between β-Oxidation of fatty acid and fatty acid biosynthesis.

10 What is oxidative deamination?

11 Enlist the four common enzymes shared for biosynthesis of isoleucine and valine.

12 Explain about significance of transamination reaction.

Q.3 (A) Draw a neat labeled diagram of ATP Synthase. (4)

(B) Describe:Use of biochemical mutant for studying intermediary metabolism. (6)

OR

Q.3 (A) Discuss components and role of ETC. (5)

(B) Explain substrate level phosphorylation with examples. (5)

Q.4 Write on:

(A) Kreb's cycle with its energetics (5)

(B) Anaplerotic reactions (5)

OR

Q.4 Write on:

(A) CO_2 assimilation pathway (5)

(B) HMP Shunt (5)

Q.5 Discuss various steps involved in β-Oxidation of Palmitoyl CoA with its energetics (10)

OR

Q.5 Discuss various steps involved in biosynthesis of saturated fatty acid. (10)

Q.6 Write notes on following:

(A) Biogenesis of murein (6)

(B) Biosynthesis of amino acid in which Chorismate is a key intermediate. (4)

OR

Q.6 Write notes on following:

(A) Krebs-Hansleit cycle (5)

(B) Stickland reaction (5)

****

— X —

[478426] SEAT No._____ No. of Printed Pages : 3

SARDAR PATEL UNIVERSITY
6rd SEMESTER - B.Sc.
April - 2017.
MICROBIOLOGY, USO6CMIC04
Medical Microbiology.

Date : 03/04/2017,MONDAY.
Time : 10-00 A.M. to 01-00.P.M Total marks : 70

Q.1 Select the correct answer for each question from the option given below. 10

1 Which of the following is an example of largest leucocytes?
(a) Neutrophiles. (b) Monocytes.
(c) Lymphocytes. (d) Basophiles.

2 The Bombay blood group contains_____.
(a) D antigen. (b) H antigen.
(c) H 1 antigen. (d) None of these.

3 _____ can be used to collect clinical specimen from stomach.
(a) Intubation. (b) Needle aspiration.
(c) Catheterization. (d) None of the these.

4 _____ refers to precipitation reaction in agar gel medium.
(a) Immunoblotting. (b) Immunodiffusion.
(c) Western blotting. (d) None of the these.

5 Which of the following disease is not transmitted by vector or vehicle transmission?
(a) Plaque. (b) Malaria.
(c) Rabies. (d) Tuberculosis.

6 When a disease occurs occasionally at irregular intervals in a human population, it is called _____ disease.
(a) Epidemic. (b) Pandemic.
(c) Sporadic. (d) Endemic.

7 Determination of SGOT and SGPT is a part of _____ function test.
(a) Kidney. (b) Liver.
(c) Cardiac. (d) None of these.

8 For diagnosis of tuberculosis,Acid fast bacilli are observed by staining _____ sample of patient.
(a) Blood. (b) Urine.
(c) Sputum. (d) Saliva.

(P.T.O.)

9 Which test is used for diagnosis of HIV?
(a) Widal test. (b) Mantoux test.
(c) ELISA. (d) None of the these.

10 Which of the following drug is used for treatment of Malaria?
(a) Chloroquine. (b) Penicillin.
(c) Streptomycin. (d) Ritonavir.

Q.2 Give short answers to the following questions. (Answer any ten) 20

1 Enlist few criteria for rejection of blood donor.

2 Give example of Granulocytes with their functions.

3 Write examples of various anticoagulants used for blood collection.

4 What is antibiogram?

5 What are rapid methods for identifying microorganism?give its example.

6 Define:- Swab and Sputum.

7 Write clinical significance of Serum Cholesterol.

8 Define:- Morbidity and Mortality test.

9 What is Bioterrorism ?

10 Enlist few pathogens that cause opportunistic infections in HIV patients.

11 What are nosocomein infections? Enlist its example.

12 Describe in brief how tuberculosis is transmitted.

Q.3 What is hemostatis? Also describe its mechanism in detail. 10

OR

Q.3 Write in detail about ABO and Rh blood group systems. 10

Q.4 Write Short note on:--
(a) ELISA. 06
(b) Phage typing. 04

OR

Q.4 Write Short note on:--
(a) Microscopy as method for identification of microorganisms. 05
(b) RIA. 05

Q.5		Write Short note on:--	
	(a)	Vaccines.	06
	(b)	Clinical significance of S bilirubin..	04
		OR	
Q.5		Write Short note on:--	
	(a)	Clinical significance of S urea and S creatinine.	06
	(b)	Types of Carrier person.	04
Q.6		Write Short note on:--	
	(a)	Malaria caused by *Pl falciparum.*	06
	(b)	Structure of HIV.	04
		OR	
Q.6		Write Short note on:--	
	(a)	Widal test.	06
	(b)	Drugs used for treatment of Tuberculosis.	04

— X —

SEAT No._____ No. of Printed Pages : 2

[23A]

SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

T. Y. B.Sc. (VI Sem) Examination - 2017[CBCS]

SATURDAY, 8th April, 2017

10:00 AM - 1:00 PM

US06CMIC05(MICROBIOLOGY)

AGRICULTURE & ENVIRONMENT MICROBIOLOGY

Maximum Marks: 70

Q.1. Each question below gives a multiple choice of answers. Choose the most appropriate one. **[10]**

1 Leghaemoglobin creates_____.

(a) anaerobic condition for optimum activity of nitrogenase enzyme
(b) suitable environment for nodule formation
(c) required O_2 concentration for optimum activity of nitrogenase enzyme
(d) none of these

2 _____is used extensively to control the spread of the Colorado beetle & codling moth.

(a) *Beauveria bassiana*
(b) *Anabenaflos aque*
(c) *Arthrobotrys oligspora*
(d) none of these

3 During nodulation ____gene is required for the activation of other nod genes.

(a) nod A
(b) nod B
(c) nod C
(d) nod D

4 _____ Group of organisms are used in the process of bioleaching.

(a) *Thiobacillus*
(b) *Sulfolobus*
(c) *Leptospira*
(d) All of these

5 Antifouling paints contain ____% CuO required to control microbial growth.

(a) 70
(b) 50
(c) 55
(d) 60

6 Rapid hydrocarbon degradation requires_____in the initial steps by most microorganisms.

(a) nitrogen
(b) phosphate
(c) molecular oxygen
(d) sulfate

7 _____is used in electrical capacitors.

(a) TCE
(b) ABS
(c) PCB
(d) All of these

8 _____&_____coverts trichloroethylene (TCE) to TCE epoxide.

(a) methane monooxygenase & toluene monooxygenase
(b) ethane monooxygenase
(c) xylene monooxygenase
(d) none of these

9 Nonrenewable energy resources contributes_____% of energy needs in developing countries.

(a) 57 (b) 20
(c) 16 (d) 40

10 _____acts as inhibitor/inhibitors of biogas production.
(a) ammonia (b) sulphates
(c) antibiotics (d) all of these

Q. 2 Short Questions (Attempt any TEN) **[20]**

1 Which two metalloproteins are required for nitrogen fixation and ammonia assimilation?
2 Define microbial inoculants & bacterization.
3 What is pelleting?
4 How one can prevent the biodeterioration of metals?
5 How cementation method is useful for copper extraction?
6 What is slope leaching?
7 How ABS removes dirt from the clothes?
8 What is xenobiotics & recalcitrance?
9 Give at list three examples of biodegradable & recalcitrant herbicides.
10 Enlist useful features of biofuel.
11 How solar energy is converted into chemical energy?
12 Explain the role of syntrophic H_2 producing bacteria in biogas production.

Q. 3 **[A]** How one can distinguish between *Rhizobium & Agrobacterium.* **[05]**
[B] Write a note on Viral pesticide. **[05]**

OR

Q. 3 [A] Explain nitrogen fixing symbiosis with non leguminous plants. **[04]**
[B] Write a note on bacterial insecticide. **[06]**

Q. 4 **[A]** Write a note on microbial enhanced oil recovery. **[04]**
[B] Define bioleaching. Explain the mechanisms involved in bioleaching process. **[06]**

OR

Q. 4 [A] Write a note on bioremediation of petroleum hydrocarbons. **[06]**
[B] Explain biodeterioration of wood. **[04]**

Q. 5 [A] Define biomagnification. Explain metal biomagnification. **[05]**
[B] Write a note on biodegradable polymers. **[05]**

OR

Q. 5 [A] Write a note on biodegradation of chlorinated hydrocarbons. **[07]**
[B] Give a comparison between linear ABS & non linear ABS in terms of biodegradability. **[03]**

Q. 6 What is biogas? Describe the process of biogas production along with advantages & disadvantages of biogas production. **[10]**

OR

Q. 6 What are biofuels? How do they differ from fossil fuel and explain in detail the conventional fuels. **[10]**

— X —

SEAT No._____ No. of Printed Pages : 2

[32&A24]

SARDAR PATEL UNIVERSITY
B.Sc. (6th Semester) EXAMINATION 2017
Friday, April 7th 2017
10:00 a.m. TO 1:00 p.m.
SUBJECT: MICROBIOLOGY US06CMIC06
(Industrial Microbial Technology)

TOTAL MARKS: 70

Note: (1) All the questions are compulsory.
(2) Figures on the right indicate marks.

Q-1 Select the correct answer for each question from the option given below [10]

1. **Which of the following cake discharge mechanism is used for fungi in rotary vacuum drum filter?**
   (A)String (B) Scraper (C) Scraper with filter aid (D) None of these
2. **Which of the following method of cell disruption can be used to obtain luciferase enzyme from *Photobacterium fischeri* ?**
   (A) Ultrasonication (B) Use of detergents
   (C) Osmotic shock (D) Alkali treatment
3. **Which bifunctional agent is commonly used in cross linking for enzyme immobilization?**
   (A)Formaldehyde (B)Acetaldehyde
   (C) Ethylene oxide (D) Glutaraldehyde
4. **In fermentation economics cost associated with fermentation equipment and facilities is included under which of the following category?**
   (A)Utility (B) Overhead (C) Capital expenditure (D) Labour
5. **Which of the following vitamin plays important role in glutamic acid fermentation?**
   (A) Thiamine (B) Biotin (C) Riboflavin (D) Biotin
6. **Which of the following type of beer is manufactured by top fermented yeast?**
   (A)Lager (B) Ales (C) Pilsen (D) Dortmund
7. **Which of the following aminoacid during penicillin biosynthesis is present in the D-isomeric form?**
   (A)α aminoadipic acid (B) Cysteine (C) Lysine (D) Valine
8. **Gluconic acid producing organisms contains which of the following enzyme?**
   (A)Glucose isomerase (B) Glucose Peroxidase
   (B) Glucose oxidase (D) Glucose kinase
9. **Which centrifuge is worked on the principle of centrifugation and filtration?**
   (A)Basket (B) Tubular bowl (C) Multichamber (D) Disc-bowl
10. **Which medium is jointly used for the detection of aerobic and anaerobic bacteria in the fermentation products?**
    (A)Macconkey's (B) Tryptone soya broth
    (C)Muller Hilton Agar (D) Fluid Thioglycolate

Q-2 Give Short answers to following questions (Any ten) [20]

[1] Why filters aids are used in the filtration process for the removal of bacterial cells from the fermentation broth?

[2] What is ultrafiltration? How can it be used to concentrate the product.

[3] How precipitation can be useful for product recovery? Give name of two agents which can cause precipitation.

[4] Write about end point determination method of bioassay with its merits and demerits.

[5] How incubation period and sterilization affect fermentation economics?

[6] Briefly write about the metabolic response method to assay fermentation product.

[7] Why hop oils are added during the beer production?

[8] Enlist various steps involved in the cheese production and give at least two examples of starter culture.

[9] Which criteria are used for the selection of Baker's yeast.

[10] What is saccharogenic amylases and starch liquefying amylase.

[11] Name the organisms involved in gluconic acid production. Why fungal cultures are preferred over bacterial cultures?.

[12] Which metal ions and precursors play important role in cyanocobalamine production?

Q-3

(A) Write a brief note on-Criteria used for the selection of recovery process. [04]

(B) Discuss various batch filters used for solid removal with its merits and demerits. [06]

OR

Q-3 What do you mean by "likes dissolve like"? Enlist various methods of liquid:liquid extraction and discuss organic solvent extraction method in detail. [10]

Q-4

(A) Write a note on- LAL test. [05]

(B) Write a note on- Ideal characteristics of test organism used in bioassay. [05]

OR

Q-4 Define immobilization and discuss various methods of immobilization in detail. [10]

Q-5

(A) Draw biosynthetic pathway of Vinegar and discuss Surface process for vinegar production in detail. [06]

(B) Discuss mashing and kettle boiling processes in beer production. [04]

OR

Q-5 Write a note on- Fermentative production of glutamic acid from *Corynebacterium glutamicum* [10]

Q-6 Describe acetone-butanol fermentation using *Clostridium acetobutylicum.* [10]

OR

Q-6 Write a note on- Fermentative production of penicillin. [10]

****

(51 & A-26) Seat No.:_____ No. of Printed Pages : 3

SARDAR PATEL UNIVERSITY

B.Sc.Sem-VI
MATHEMATICS: US06CMTH01
(Real Analysis-III)

27th March'2017, Monday 10.00 am to 01:00 pm

Maximum Marks: 70

Q.1 Choose the correct option in the following questions, mention the correct option in the answerbook. [10]

(1) A bounded function f is said to be integrable over $[a,b]$, if there is fixed number I so that for every $\epsilon > 0$ there exists some $\delta > 0$ such that
(a)$|S(P,f) - I| < \epsilon$ for every partition P with $\mu(P) > \delta$ (b)$|S(P,f) - I| > \epsilon$ for every partition P with $\mu(P) > \delta$ (c)$|S(P,f) - I| < \epsilon$ for every partition P with $\mu(P) < \delta$ (d)$|S(P,f) - I| > \epsilon$ for every partition P with $\mu(P) > \delta$

(2) In usual notations, the Cauchy's form of remainder in Maclaurin's theorem is
(a)$\frac{x^n(1-\theta)^{n-1}}{(n-1)!}f^n(\theta x)$ (b)$\frac{x^n(1-\theta)^{n-1}}{(n-1)!}f^{n-1}(\theta x)$ (c)$\frac{x^n(1-\theta)^n}{(n-1)!}f^{n-1}(\theta x)$
(d)$\frac{x^{n-1}(1-\theta)^{n-1}}{(n-1)!}f^n(\theta x)$

(3) If μ is a mesh of the partition $P = \{x_0, x_1, x_2, \ldots, x_n\}$ for $[a,b]$ then for every $i = 1, 2, \ldots, n$
(a) $\Delta x_i = \mu$ (b) $\Delta x_i < \mu$ (c) $\Delta x_i \geq \mu$ (d) $\Delta x_i \leq \mu$

(4) A function f cannot be integrable over $[a,b]$, if it is
(a) Increasing over $[a,b]$ (b) Decreasing over $[a,b]$ (c) Continuous over $[a,b]$
(d) None of these

(5) If P is a partition of $[a,b]$, then
(a) $a \in P$, but $b \notin P$ (b) $a \notin P$, but $b \in P$ (c) $a \in P$ and $b \in P$ (d) $a \notin P$ and $b \notin P$

(6) If a function f has a finite number of points of discontinuity over $[a,b]$ then it is
(a) not integrable over $[a,b]$ (b) integrable over $[a,b]$
(c) monotonic over $[a,b]$ (d) none

(7) A function $f(x)$ has a minimum at c if while x passes through c, f changes from
(a) an increasing to a decreasing function (b) a decreasing to an increasing function
(c) an increasing to a constant function (d) none

(8) For a bounded function f defined on $[a,b]$ and two partitions P_1, P_2 and $P^* = P_1 \cup P_2$
(a) $U(P_1,f) \leq U(P^*,f)$ (b) $U(P_1,f) < U(P^*,f)$ (c) $U(P_1,f) \geq U(P^*,f)$
(d) $U(P_1,f) > U(P^*,f)$

(9) If a number c is a stationary point of a derivable function f then
(a)$f(c) = 0$ (b)$f'(c) > 0$ (c)$f'(c) = 0$ (d)$f'(c) < 0$

(10) A refinement of a partition P contains
(a) At least one element less than the elements of P (b) At least one element more than the elements of P (c) All the elements are different from P (d) No element different from P

Q.2 Attempt any **Ten**. [20]

(1) In usual notations, prove that $m(b-a) \leq \int_a^b f dx \leq M(b-a), a \leq b$.
(2) Define: Stationary Point and Stationary Value.
(3) Define extreme values.
(4) Find the equal partition of an interval $[-1,1]$.
(5) Show that if two functions have equal derivatives at all points of $[a,b]$, then they differ only by a constant.
(6) Prove that $\frac{\sin\alpha - \sin\beta}{\cos\beta - \cos\alpha} = \cot\theta$, where $0 < \alpha < \theta < \beta < \frac{\pi}{2}$.
(7) State First mean value theorem of differential Calculus. [PTO]

(51 & A-96) Seat No.:_____ No. of Printed Pages : 3

SARDAR PATEL UNIVERSITY

B.Sc.Sem-VI
MATHEMATICS: US06CMTH01
(Real Analysis-III)

27th March'2017, Monday 10.00 am to 01:00 pm

Maximum Marks: 70

Q.1 Choose the correct option in the following questions, mention the correct option in the answerbook. [10]

(1) A bounded function f is said to be integrable over $[a,b]$, if there is fixed number I so that for every $\epsilon > 0$ there exists some $\delta > 0$ such that
(a)$|S(P,f) - I| < \epsilon$ for every partition P with $\mu(P) > \delta$ (b)$|S(P,f) - I| > \epsilon$ for every partition P with $\mu(P) > \delta$ (c)$|S(P,f) - I| < \epsilon$ for every partition P with $\mu(P) < \delta$
(d)$|S(P,f) - I| > \epsilon$ for every partition P with $\mu(P) > \delta$

(2) In usual notations, the Cauchy's form of remainder in Maclaurin's theorem is
(a)$\frac{x^n(1-\theta)^{n-1}}{(n-1)!} f^n(\theta x)$ (b)$\frac{x^n(1-\theta)^{n-1}}{(n-1)!} f^{n-1}(\theta x)$ (c)$\frac{x^n(1-\theta)^n}{(n-1)!} f^{n-1}(\theta x)$
(d)$\frac{x^{n-1}(1-\theta)^{n-1}}{(n-1)!} f^n(\theta x)$

(3) If μ is a mesh of the partition $P = \{x_0, x_1, x_2, \ldots, x_n\}$ for $[a,b]$ then for every $i = 1, 2, \ldots, n$
(a) $\Delta x_i = \mu$ (b) $\Delta x_i < \mu$ (c) $\Delta x_i \geq \mu$ (d) $\Delta x_i \leq \mu$

(4) A function f cannot be integrable over $[a,b]$, if it is
(a) Increasing over $[a,b]$ (b) Decreasing over $[a,b]$ (c) Continuous over $[a,b]$
(d) None of these

(5) If P is a partition of $[a,b]$, then
(a) $a \in P$, but $b \notin P$ (b) $a \notin P$, but $b \in P$ (c) $a \in P$ and $b \in P$ (d) $a \notin P$ and $b \notin P$

(6) If a function f has a finite number of points of discontinuity over $[a,b]$ then it is
(a) not integrable over $[a,b]$ (b) integrable over $[a,b]$
(c) monotonic over $[a,b]$ (d) none

(7) A function $f(x)$ has a minimum at c if while x passes through c, f changes from
(a) an increasing to a decreasing function (b) a decreasing to an increasing function
(c) an increasing to a constant function (d) none

(8) For a bounded function f defined on $[a,b]$ and two partitions P_1, P_2 and $P^* = P_1 \cup P_2$
(a) $U(P_1,f) \leq U(P^*,f)$ (b) $U(P_1,f) < U(P^*,f)$ (c) $U(P_1,f) \geq U(P^*,f)$
(d) $U(P_1,f) > U(P^*,f)$

(9) If a number c is a stationary point of a derivable function f then
(a)$f(c) = 0$ (b)$f'(c) > 0$ (c)$f'(c) = 0$ (d)$f'(c) < 0$

(10) A refinement of a partition P contains
(a) At least one element less than the elements of P (b) At least one element more than the elements of P (c) All the elements are different from P (d) No element different from P

Q.2 Attempt any **Ten**. [20]

(1) In usual notations, prove that $m(b-a) \leq \int_a^b f\,dx \leq M(b-a), a \leq b$.
(2) Define: Stationary Point and Stationary Value.
(3) Define extreme values.
(4) Find the equal partition of an interval $[-1,1]$.
(5) Show that if two functions have equal derivatives at all points of $[a,b]$, then they differ only by a constant.
(6) Prove that $\frac{\sin\alpha - \sin\beta}{\cos\beta - \cos\alpha} = \cot\theta$, where $0 < \alpha < \theta < \beta < \frac{\pi}{2}$.
(7) State First mean value theorem of differential Calculus. [PTO]

Q.3 A) Write a Resume for the post of an Accountant in the bank. (08)

OR

Write a Resume for the post of a Librarian in the college.

Q.3 B) Read the following passage and answer the Questions given below. (10)

Doctors are the custodians of human health. To patients, they are like angels who give them the message of hope and life. On the other hand, engineers are concerned with the inanimate things like machines which have no hopes and no fears. Doctors are, therefore, more human than engineers. A doctor has to work with the missionary zeal and his profession calls for self-sacrifice. He cannot ignore a patient suffering from pain. Even at the cost of his own health, comfort and convenience, he treats the patients. On wintry nights when all the people sleep in their cozy beds, he stands by the side of the patients. On the other hand, an engineer's profession does not require so much self sacrifice. Doctors have greater social responsibility than engineers. They are directly responsible for the health of the people. While engineers responsibility is indirect. If there are no industries, no machines, no equipments, no electricity and no medium of communications, life will become very miserable. But it will become more miserable if there are no doctors to look after the human health. A doctor's duties are harder in comparison to those of an engineer. An engineer has to handle an iron machine, whereas a doctor has to handle a human machine which is very complex and complicated. It has been observed that the medical profession has produced a great number of public spirited men than the engineering profession.

Qs :

1) Why are doctors considered more human than engineers?
2) How should a doctor treat a patient?
3) What will happen if there are no doctors?
4) What are the differences between the profession of a doctor and an engineer?
5) How do you look at the profession of a doctor?

Q.4 (A) Match words in column 'A' with their meanings in column 'B'. (06)
(Any Six)

	'A'		'B'
1)	Possessor	A)	Traditional
2)	Old fashioned	B)	Influence, advice
3)	Persuasion	C)	Waste matter
4)	Rubbish	D)	Timid
5)	Annoyance	E)	Rebuke angrily
6)	Mean time	F)	Owner
7)	Scold	G)	The period of time between two events
8)	Coward	H)	Make slightly angry

Q.4 (B) Fill in the blanks by choosing appropriate phrasal verbs from those given in the bracket. **(Any Six)** (06)

(get back to, made for, got behind, get back, ran after, put aside, call back, runs on,)

1) We _____ home when it started raining.
2) All the emplyees _____ their manager.
3) What time did you _____ last night ?
4) The police _____ the guy who had stolen the jewellery.
5) I am waiting for my friend to _____ me _____.
6) The staff members decided to _____ their differences.
7) This vehicle _____ diesel.
8) I will _____ you as soon as I hear the news.

****

(31A & A-26) **Seat No.:**_____ No of printed pages : 3

SARDAR PATEL UNIVERSITY
B.Sc.(SEMESTER - VI) EXAMINATION - 2017
Tuesday , 28th March , 2017
MATHEMATICS : US06CMTH02
(COMPLEX ANALYSIS)

Time : 10:00 a.m. to 1:00 p.m. **Maximum Marks : 70**

Que.1 Fill in the blanks. 10

(1) $f(z) = (x^2 - y^2 - 2y) + i(2x - 2xy)$ can be expressed as $f(z) =$.....

(a) $\bar{z}^2 + 2z$ (b) $\bar{z}^2 + 2iz$ (c) $\bar{z}^2 - 2iz$ (d) $\bar{z}^2 + iz$

(2) $\lim_{z \to 0} \frac{z}{\bar{z}} =$ .....

(a) -1 (b) 0 (c) 1 (d) does not exist

(3) $f(z) = \frac{2z}{z(z^2+1)}$ is analytic in .....

(a) $\mathbb{C} - \{\pm i\}$ (b) $\{0 , \pm i\}$ (c) $\mathbb{C} - \{0\}$ (d) $\mathbb{C} - \{0 , \pm i\}$

(4) If C-R equations are satisfied at z_0 then f(z) is ..... at z_0 .

(a) need not be differentiable (b) not differentiable (c) differentiable (d) none of these .

(5) $exp(2 \pm 3\pi i) =$ .....

(a) e^{-2} (b) e^2 (c) $-e^2$ (d) $-e$

(6) $e^{z_1} = e^{-z_2}$ then $z_1 =$ .....

(a) $-z_2 + 2n\pi i$ (b) $z_2 + 2n\pi$ (c) $-z_2$ (d) z_2

(7) $cosiy =$ .....

(a) $icoshy$ (b) $coshy$ (c) $-coshy$ (d) $icosy$

(8) The image of line $x = c_1$, $c_1 \neq 0$ under the transformation $w = 1/z$ is .....

(a) circle (b) square (c) rectangle (d) hyperbola

(9) Fixed point of $w = \frac{6z - 9}{z}$ is .....

(a) 0 (b) i (c) 2 (d) 3

(10) Image of $x < 0$ under the transformation $w = (1 + i)z$ is .....

(a) $u < v$ (b) $v < u$ (c) $u < -v$ (d) $u > -v$

Que.2 Answer the following (Any Ten) 20

(1) Prove that limit of function is unique,if it exist.

(2) By using definition prove that $\lim_{z \to z_0} (z^2 + c) = {z_0}^2 + c$, where c is complex constant.

(3) If f and g are differentiable then prove that fg is differentiable .

(4) Prove that $f(z) = e^{ix+y}$ is nowhere analytic .

(P.T.O.)

(5) Check whether $f(z) = \cosh x \cos y + i \sinh x \sin y$ is entire or not .Verify it .

(6) Prove that $e^{-y} \sin x$ and $-e^{-y} \cos x$ are harmonic at each point of domain of xy-plane.

(7) Prove that $|exp(-2z)| < 1$ iff $Rez > 0$.

(8) Prove that $\frac{d}{dz}(\coth z) = -\operatorname{cosech}^2 z$.

(9) Find all values of $\sinh^{-1} z = log(z + \sqrt{z^2+1})$.

(10) Prove that the general linear transformation $w = Az + B$, $A \neq 0$, A and B are complex constant, gives expansion or contraction and a rotation followed by a translation.

(11) Find image of $a \leq x \leq b$; $0 \leq y \leq \pi$ under the transformation $w = e^z$.

(12) For the transformation $w = \sin z$,prove that a line $x = c_1$, $(0 < c_1 < \pi/2)$ is mapped onto the right hand branch of the hyperbola $\frac{u^2}{\sin^2 c_1} - \frac{v^2}{\cos^2 c_1} = 1$.

Que.3 (a) Give an example of function such that its real and imaginary component have continuous partial derivative of all order at a point but the function is not differentiable at that point.Verify it. 6

(b) If $f(z) = \frac{x^3 y(-y+ix)}{z(x^6+y^2)}$, $z \neq 0$, $f(0) = 0$ 4

(i) Is $\lim_{z \to 0} f(z)$ exists ? (ii) Is $f(z)$ differentiable at 0 ? . Verify it .

OR

Que.3 (a) State and prove chain rule for differentiating composite functions. 6

(b) By using definition of limit prove that $\lim_{z \to (1-i)} (x + i(2x+y)) = 1 + i$. 4

Que.4 (a) State and prove sufficient conditions for differentiability of $f(z)$. 5

(b) Let $f(z) = u(x,y) + iv(x,y)$ and $f'(z)$ exist at $z_0 = x_0 + iy_0$.Prove that the first order partial derivatives of u and v must exist at (x_0, y_0) and they satisfies the Cauchy-Reimann equations $u_x = v_y$; $u_y = -v_x$ *at* (x_0, y_0). 5

OR

Que.4 (a) Find a harmonic conjugate $v(x,y)$ for harmonic function $u(x,y) = y^3 - 3x^2 y$. 4

(b) For $f(z) = iz + 2$,prove that $f'(z)$ and $f"(z)$ exist everywhere. 3

(c) Give an example of function which is analytic at every non-zero points.Verify it. 3

Que.5 (a) Prove that $\overline{exp(iz)} = exp(i\bar{z})$ iff $z = n\pi$, $n \in \mathbb{Z}$. 4

(b) Solve the equation $sinhz = i$. 3

(c) Evaluate $log(-\sqrt{3} - i)$ *and* $Log(-1 - \sqrt{3}i)$. 3

OR

Que.5 (a) Describe $\cos^{-1} z$ in terms of logarithm .Hence find all values of $\cos^{-1}(\sqrt{2})$. 5

(b) Prove that $|\cos z|^2 = \cos^2 x + \sinh^2 y$. 3

(c) Prove that $|\sinh x| \leq |\cosh z| \leq \cosh x$. 2

Que.6 (a) Prove that all linear fractional transformation that maps the upper half plane $Im\ z > 0$ on to the open disk $|w| < 1$ and the boundary $Im\ z = 0$ on to the boundary of $|w| = 1$ is given by $w = e^{i\alpha}\left[\frac{z - z_0}{z - \overline{z_0}}\right]$, $Im\ z_0 > 0$. Also prove the converse. 6

(b) Find linear fractional transformation that maps the points $z_1 = 2$, $z_2 = i$, $z_3 = -2$ *on to* $w_1 = 1$, $w_2 = i$, $w_3 = -1$ respectively . 4

OR

Que.6 (a) Discuss the image of $w = (i+1)z + 2$. Hence sketch the rectangle $1 \leq x \leq 2$, $1 \leq y \leq 4$ and its image. 5

(b) Find the image of semi infinite strip $x > 0$, $0 < y < 1$ under the transformation $w = i/z$. Also sketch the strip and its image. 5

(48 & A-25) ; **SEAT No._____** No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. (*SEMESTER – VI*) EXAMINATION-2017

March 31, 2017, Friday

10.00 a.m. to 1.00 p.m.

US06CMTH03(Topology)

Maximum Marks: 70

Q.1 Choose the correct option in the following questions, mention the correct option in the answerbook. [10]

(1) Any topology on a non-empty set is _____ the indiscrete topology on that set.
(a) coarser than (b) finer than (c) not comparable with (d) none

(2) Which of the following subset of $\mathbb{R}$ is not a $\mathcal{L}$-neighborhood of 4?
(a) (3, 5] (b) [4, 5] (c) [4, 6) (d) [2, 4]

(3) In $\mathbb{R}$ with discrete topology, the set of all cluster points of $(-1,1)$ is...
(a) $(-1,1)$ (b) $[-1,1]$ (c) $\emptyset$ (d) $\mathbb{R}$

(4) If A is a closed subset of a topological space $(X,\mathcal{T})$ then
(a) $A = X$ (b) $A' = X$ (c) $A' \subset A$ (d) $\bar{A} = X$

(5) The $\mathcal{I}-$ interior of $(0, 2) \subset \mathbb{R}$ is.....
(a) $(0, 2)$ (b) $[0, 2]$ (c) $\mathbb{R}$ (d) $\emptyset$

(6) Let $X = \{0,1\}$. Then for which of the following $\mathcal{T}$, $(X,\mathcal{T})$ is not connected?
(a) $\{X, \emptyset, \{0\}\}$ (b) $\{X, \emptyset, \{0\}, \{1\}, \{0,1\}\}$
(c) $\{X, \emptyset, \{1\}\}$ (d) None of these

(7) Which of the following subset of $[0,1]$ is not open in $\mathcal{U}$-relative topology of $[0,1]$?
(a) $(0, 1/2)$ (b) $(0,1)$ (c) $[1/2, 3/4)$ (d) None of these

(8) Which of the following is a covering of $(\mathbb{R}, \mathcal{U})$?
(a) $\mathcal{C} = \{(n,\ 2n+1) :\ n \in \mathbb{N}\}$ (b) $\mathcal{C} = \{(n,\ 4n) :\ n \in \mathbb{N}\}$
(c) $\mathcal{C} = \{(-2n,\ 0) :\ n \in \mathbb{N}\}$ (d) $\mathcal{C} = \{(-n,\ 2n) :\ n \in \mathbb{N}\}$

(9) Which of the following subset of $\mathbb{R}$ is compact in $\mathcal{U}$-topology?
(a) $\mathbb{R}$ (b) $\mathbb{Z}$ (c) $\mathbb{Q}$ (d) $[0,\ 1]$

(10) Which of the following is not true for topological spaces?
(a) Every T_2-space is T_1-space (b) Every T_1-space is T_2-space
(c) Every T_3-space is T_2-space (d) $(\mathbb{R},\mathcal{U})$ is a T_2-space

Q.2 Attempt any Ten: [20]

(1) Show that the sets $\mathbb{R}$ and $\emptyset$ are $\mathcal{U}$-open

(2) Is $[1,3] \cup [-1,5]$ a $\mathcal{U}$-neighbourhood of 3? Justify!

(3) Show that indiscrete topology satisfies all the conditions for becoming a topological space.

(4) For any topologies $\mathcal{T}_1$ and $\mathcal{T}_2$ of $\mathbb{R}$ show that the mapping $f : \mathbb{R} \to \mathbb{R}$ where $f(x) = 2, \forall x \in \mathbb{R}$, is $\mathcal{T}_1$-$\mathcal{T}_2$ continuous.

(5) For $\mathbb{Z} \subset \mathbb{R}$, find $\mathbb{Z}'$ relative to $\mathcal{D}$-topology.

(6) Define: (i) Continuous function (ii) Bicontinuous function

(7) For $X = \{a,b,c\}$ determine whether $\mathcal{T} = \{X, \emptyset, \{a,b\}, \{c\}\}$ is connected or disconnected.

(8) Are [0, 1) and [0, 2] closed in $\mathcal{U}$ relative topology of [0, 3]? Justify!

(9) Define : (i) Compact Space (ii) Hausdorff Space

(10) Define: T_1-space and Regular space.

(P.T.O.)

(11) Prove that every Hausdorff space is T_1-space.
(12) Prove that every metric space is a Hausdorff space

Q.3

(a) Let J be the set of all integers and $\mathcal{T}$ be a collection of subsets G of J where $G \in \mathcal{T}$ whenever $G = \emptyset$ or $G \neq \emptyset$ and $p, p \pm 2, p \pm 4, ..., p \pm 2n, ...$ belong to G whenever $p \in G$. Prove that $\mathcal{T}$ is a non-trivial topology for J. [05]

(b) Let $(X, \mathcal{T})$ be a topological space and let $J_n = \{1, 2, 3, ..., n\}$. If $F_1, F_2, ..., F_n$ are $\mathcal{T}$-closed subsets of X then prove that $\bigcup\{F_i / \ i \in J\}$ is a $\mathcal{T}$-closed set. [05]

OR

Q.3

(c) Consider the topology $\mathcal{L}$ on $\mathbb{R}$ where $G \subset \mathbb{R}$ is $\mathcal{L}$-open if $G = \emptyset$ or $G \neq \emptyset$ and for each $p \in G$ there is a set $H = \{x \in \mathbb{R} / a \leqslant x \ < b\}$ for some $a < b$ such that $p \in H \subset G$. Prove that $\mathcal{L}$ is a topology on $\mathbb{R}$. [05]

(d) Let $(X, \mathcal{T})$ be a topological space and let A be a subset of X. Prove that A is $\mathcal{T}$-open set iff A contains a $\mathcal{T}$-neighbourhood of each of its points. [05]

Q.4

(a) Let $(X, \mathcal{T})$ be a topological space and let A be a subset of X and A' be the set of all cluster points of A. Prove that $A \cup A'$ is $\mathcal{T}$-closed. [04]

(b) If $(X, \mathcal{T}_2)$ and $(Y, \mathcal{T}_2)$ are topological spaces and f is a mapping from X into Y then prove that the mapping f is continuous at $x \in X$ iff the inverse image under f of every $\mathcal{T}_2$-neighborhood of $f(x)$ is a $\mathcal{T}_1$-neighborhood of x. [06]

OR

Q.4

(c) Let $(X, \mathcal{T})$ be a topological space and a A be a subset of X. Then prove that $Int(A)$ is an open set and it is the largest open subset of A. [05]

(d) Determine which of the following subsets of $\mathbb{R}$ are (i) $\mathcal{U}$-closed (ii) $\mathcal{L}$-closed (iii) $\mathcal{D}$-closed. [05]
(a) $\mathbb{R}$ (b) $\{\frac{1}{n} / n \in J^+\}$ (c) $\mathbb{Z}$

Q.5

(a) If $(Y, \mathcal{T}_Y)$ is a compact subspace of a Hausdorff space $(X, \mathcal{T})$, then prove that Y is $\mathcal{T}$ closed. [04]

(b) Prove that a topological space $(X, \mathcal{T})$ is disconnected iff X has a nonempty proper subset that is both $\mathcal{T}$-open and $\mathcal{T}$-closed. [06]

OR

Q.5

(c) Let $(X, \mathcal{T})$ be a topological space and let Y be a subset of X. Prove that a subset S of Y is $\mathcal{T}_Y$-closed iff there is a $\mathcal{T}$-closed set F such that $S = F \cap Y$. [06]

(d) Let $(X, \mathcal{T}_1)$ and $(Y, \mathcal{T}_2)$ be topological spaces and let f be a $\mathcal{T}_1\mathcal{T}_2$-continuous mapping of X onto Y. If $(X, \mathcal{T}_1)$ is connected then prove that $(Y, \mathcal{T}_2)$ is also connected. [04]

Q.6

(a) If $(X, \mathcal{T})$ is compact and A is an infinite subset of X, then prove that A has atleast one cluster point in X. [04]

(b) Prove that a subspace $(Y, \mathcal{U}_Y)$ of $(R, \mathcal{U})$ is compact, iff Y is bounded and $\mathcal{U}$-closed. [06]

OR

Q.6

(c) Let $(X, \mathcal{T}_1)$ and $(Y, \mathcal{T}_2)$ be topological spaces and let f be a $\mathcal{T}_1\mathcal{T}_2$-continuous mapping of X onto Y. If $(X, \mathcal{T}_1)$ is compact then prove that $(Y, \mathcal{T}_2)$ is also compact. [04]

(d) If $(X, \mathcal{T})$ is a compact space, and if (Y, ψ) is a Hausdorff space, and if f is a one-to-one $\mathcal{T}$-ψ continuous mappingof X onto Y, then prove that f is a homeomorphism. [06]

— X —

SEAT No._____ No. of Printed Pages : 2

[487A25] SARDAR PATEL UNIVERSITY

B.Sc. (*SEMESTER – VI*) EXAMINATION-2017

April 3, 2017, Monday

10.00 a.m. to 1.00 p.m.

US06CMTH04(MATHEMATICS) (Abstract Algebra-II)

Maximum Marks: 70

Q.1 Choose the correct option in the following questions, mention the correct option in the answerbook. [10]

(1) ..... is regular element of $\mathbb{Z}_9$.
(a) 3 (b) 4 (c) 6 (d) none of these

(2) Characteristic of every field is either zero or .....
(a) prime (b) 4 (c) not prime (d) integer

(3) ..... is regular element of $\{a+b\sqrt{-5}/a,b\in\mathbb{Z}\}$.
(a) 0 (b) $\{\pm i\}$ (c) $\{\pm 1\}$ (d) $\{1+\sqrt{-5}\}$

(4) ..... is a simple ring .
(a) $\mathbb{Z}$ (b) $\mathbb{Q}$ (c) $\mathbb{N}$ (d) none of these

(5) If R is ring then $R/\{0\}$ = ...
(a) Z (b) $\{1\}$ (c) $\{0\}$ (d) R

(6) If R is commutative ring with 1 and $Ra \subset Rb$ then .....
(a) a = b (b) $a \subset b$ (c) a/b (d) b/a

(7) In $\mathbb{Z}+i\mathbb{Z}$, gcd of 2 and $-1+5i$ is .....
(a) $2+i$ (b) $2-i$ (c) i (d) $1-i$

(8) If R is a commutative ring, $f(x), g(x) \in R[x]$ then
$degree(fg)$.....$degree(f)+degree(g)$.
(a) $>$ (b) $\leq$ (c) $=$ (d) $\geq$

(9) If F is field , $f(x) \in F[x]$, $\alpha \in F$ is a root of $f(x)$ then .....
(a) $(x-\alpha)/f(x)$ (b) $(x+\alpha)/f(x)$ (c) $f(x)/(x-\alpha)$ (d) $f(x)/(x+\alpha)$

(10) If $R = \mathbb{Z}+i\mathbb{Z}$, $f(x) = 2x^2-(1+i)x-2$ then content of f is .....
(a) $1-i$ (b) $1+i$ (c) $2-i$ (d) $2+i$

Q.2 Attempt the following (Any ten). [20]

(1) Let f be a ring homomorphism ,then prove that f is one-one if $Kerf = 0$.
(2) Find Characteristic of ring $\mathbb{Z}_5$.
(3) Find all the regular elements of $\mathbb{Z}_n$.
(4) Find the quotient field of $2\mathbb{Z}$.
(5) Find $\mathbb{Z}_6/I$, *where* $I = \{\bar{0},\bar{2},\bar{4}\}$.
(6) Let $R = C[0,1]$.Prove that $I = \{\ x\ /x \in R,\ x(1/2) = 0\}$ is an ideal in R.
(7) Define Euclidean Domain with example.
(8) Show that $1+3i$ divides 10 in $\mathbb{Z}+i\mathbb{Z}$.
(9) Show that 1+i is irreducible in $\mathbb{Z}+i\mathbb{Z}$.
(10) Define Root of polynomial and Content of polynomial.

(PTO)

(11) Find C(f) for $f(x) = 3x^3 - 2x^2 + 6x + 9 \in \mathbb{Z}[x]$.
(12) Find all roots of $x^3 + 5x$ in $\mathbb{Z}_6$.

Q.3

(a) Let $R = \mathbb{C}$, $R' = \left\{ \begin{pmatrix} a & -b \\ b & a \end{pmatrix} / a, b \in \mathbb{R} \right\}$,then prove that $R \simeq R'$. [05]

(b) Prove that the only isomorphism of $\mathbb{Q}$ onto $\mathbb{Q}$ is the identity map $I_{\mathbb{Q}}$. [05]

OR

Q.3

(c) State and prove Cayley's theorem for rings. [05]

(d) Prove that every finite integral domain is a field. [05]

Q.4

(a) Prove that P is prime ideal of $\mathbb{Z}$ iff either $P = 0$ or $P = p\mathbb{Z}$, for some prime number p . [05]

(b) Prove that every commutative simple ring with unit element is a field. [05]

OR

Q.4

(c) If R is a commutative ring with 1,then prove that every maximal ideal in R is a prime ideal. [05]

(d) State and prove First isomorphism theorem for ring. [05]

Q.5

(a) Show that the ring of Gaussian integers is Euclidean domain. [05]

(b) Show that $1 + 2\sqrt{-5}$ is an irreducible element but not a prime element in $\{a + b\sqrt{-5}/a, b \in \mathbb{Z}\}$. [05]

OR

Q.5

(c) Let R be an integral domain with unit element,then prove that $p \in R$ is prime element iff the ideal $P = Rp = \{xp \ / \ x \in R\}$ is a prime ideal. [05]

(d) Prove that every principal ideal domain is factorization domain. [05]

Q.6

(a) State and prove Gauss theorem. [05]

(b) Let F be a field and $f(x) \in F[x]$ be of degree 2 or 3.Then prove that $f(x)$ is reducible iff $f(x)$ has a root in F. [05]

OR

Q.6

(c) Let R be a unique factorization domain . Then prove that the product of two primitive polynomials over R is also a primitive polynomial. [05]

(d) State and prove Eisenstein's criterion. [05]

— X —

[24A] SEAT No._____ No. of Printed Pages : 3

Sardar Patel University, Vallabh Vidyanagar

B.Sc. Examinations: 2016-17

Subject : Mathematics US06CMTH05 Max. Marks : 70

Graph Theory

Date: 08/04/2017 Timing: 10:00 am - 01:00 pm

Q: 1. Answer the following by choosing correct answers from given choices. **10**

[1] If there are 5 edges in a simple graph then the total of degrees of vertices of the graph is
[A] 5 [B] 10 [C] 15 [D] 20

[2] If the number of edges, none of them is a self-loop, connected with a vertex is 4 then its degree is
[A] 1 [B] 2 [C] 4 [D] 8

[3] If terminal vertices in a walk are not same then it is called
[A] an open walk [B] closed walk [C] null graph [D] none

[4] A Hamiltonian Path in a graph traverses through
[A] All vertices [B] All edges [C] All vertices and edges [D] none

[5] The ring sum of two graphs does not include
[A] common edges [B] common vertices [C] pendent vertices [D] none

[6] A connected graph with atleast one odd vertex is not
[A] an Euler graph [B] a tree [C] a complete graph [D] none

[7] The nullity of a graph with 5 vertices, 6 edges and 2 components is
[A] 1 [B] 2 [C] 3 [D] 4

[8] A tree is a ____-connected graph.
[A] 0 [B] 1 [C] 2 [D] 3

[9] If graphs G_1 and G_2 are isomorphic and nullity of G_1 is 7 then nullity of G_2 is
[A] 7 [B] 14 [C] 21 [D] 49

[10] The number of faces in a simple connected planar graph with 8 edges and 6 vertices is
[A] 2 [B] 4 [C] 6 [D] 8

Q: 2. Answer ANY TEN of the following. **20**

[1] Discuss Utilities problem

[2] Define : (i) Vertex disjoint subgraph (ii) Path

[3] Define : (i) Parallel Edges (ii) Incidence

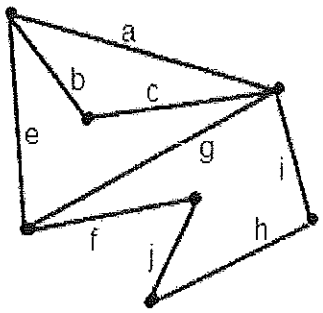
(PTO)

[4] Draw all labeled trees with four vertices.

[5] Define Fusion of vertices with an example.

[6] Explain Arbitrarily Traceable Graphs with an example.

[7] Find a spanning tree of the following graph and write the set of corresponding chords



[8] Give an example of a Separable graph

[9] Describe network flows

[10] For a simple connected planar graph with n-vertices , e-edges $(e > 2)$ and f-regions prove the following.
(i) $e \geqslant \frac{3}{2}f$ (ii) $e \leqslant 3n - 6$

[11] Define Homeomorphic graphs with an example.

[12] Write a short note on Kurtowski's Second graphs

Q: 3 [A] Prove that a graph G is disconnected *iff* its vertex set V can be partitioned into two non-empty disjoint subsets V_1 and V_2 such that there exists no edge in G whose one end vertex is in subset V_1 and other in subset V_2 5

[B] Prove that the maximum number of edges in a simple graph with n vertices is $\frac{n(n-1)}{2}$ 5

OR

Q: 3 [A] Prove that a simple graph with n vertices and k-components can have at most $\frac{(n-k)(n-k+1)}{2}$ edges. 5

[B] If a graph (connected or disconnected) has exactly two vertices of odd degree then prove that there must be a path joining these two vertices. 5

Q: 4 [A] Prove that there is one and only one path between every pair of vertices in a tree. 5

[B] Prove that in a complete graph with n vertices there are $\frac{n-1}{2}$ edge disjoint Hamiltonian circuits, if n is an odd number $\geqslant 3$. 5

OR

Q: 4 [A] Prove that every tree has either one or two centers. 5

[B] Define Tree and prove that a graph is a tree *iff* it is minimally connected. 5

Q: 5 [A] Prove that with respect to given spanning tree T , a branch b_i that determines fundamental cut-set S, is contained in every fundamental circuit associated with the chord in cut-set S and no other. 5

[B] Prove that in a connected graph G any minimal set of edges containing at least one branch of every spanning tree of G is a cut-set. 5

OR

Q: 5 [A] Prove that every cut-set in a connected graph G must contain at least one branch of every spanning tree. 5

[B] Prove that the vertex connectivity of any graph G can never exceed the edge connectivity of G. 5

Q: 6 [A] State and prove Euler's theorem for planar graphs. 5

[B] Using geometric arguments prove that Kuratowski's first graph is non-planar. 5

OR

Q: 6. Define Planar graph and prove that a graph has a dual *iff* it is planar. 10

—X—

SEAT No._____ No of printed pages : 3

[338A23]

SARDAR PATEL UNIVERSITY
B.Sc.(SEMESTER - VI) EXAMINATION - 2017
Friday , 7th April , 2017
MATHEMATICS : US06CMTH06
(MECHANICS - 2)

Time : 10:00 a.m. to 1:00 p.m. Maximum Marks : 70

Que.1 Fill in the blanks. 10

(1) Unit of angular momentum is .....

(a) $lb.ft./sec^2.$ (b) $lb.ft./sec.$ (c) $gm.ft^2./sec.$ (d) $lb.ft^2./sec.$

(2) The increase in kinetic energy = ...

(a) constant (b) workdone by force (c) force (d) none of above

(3) If a particle slide down on a smooth incline plane starting from the rest then potential energy at time t is .....

(a) $mgh - mgx\sin\alpha$ (b) $mgx\sin\alpha$ (c) $mgh - mgx$ (d) mgx

(4) Time of flight of projectile is .....

(a) $\frac{2v_0\sin\alpha}{g}$ (b) $\frac{v_0\sin\alpha}{g}$ (c) $\frac{v_0^2\sin 2\alpha}{g}$ (d) $\frac{v_0^2\sin^2\alpha}{2g}$

(5) The equation of motion of projectile is .....

(a) $y = x\tan\alpha - \frac{gx^2}{2u^2\cos^2\alpha}$ (b) $y = u\sin\alpha\, t - \frac{gt^2}{2}$ (c) $y = x\tan\alpha + \frac{gx^2}{2u^2\cos^2\alpha}$ (d) both a and b

(6) Time for Maximum height of projectile is .....

(a) $\frac{2v_0\sin\alpha}{g}$ (b) $\frac{v_0\sin\alpha}{g}$ (c) $\frac{v_0^2\sin\alpha}{g}$ (d) $\frac{v_0^2\sin^2\alpha}{2g}$

(7) Each planet describes an ..... with the sun in one focus .

(a) ellipse (b) circle (c) parabola (d) hyperbola

(8) The squares of the periodic times of the planets are proportional to the ..... of the semi major axis of their orbits .

(a) cube roots (b) square roots (c) squares (d) cubes

(9) If u_1, u_2 are velocity of sphere before collision and u_1', u_2' are velocity of sphere after collision, then the loss of kinetic energy during impact is .....

(a) $(1-e^2)T$ (b) $(1+e^2)T$ (c) $(1-e^2)T'$ (d) $(1+e^2)T'$

(10) Instantaneous change in motion of any system is $\hat{N}$ = ...

(a) ΔM_x (b) h (c) Δh (d) ΔM_y

Que.2 Answer the following (Any ten) 20

(1) Find linear momentum and angular momentum in polar co-ordinate system .

(2) Prove that the rate of change of linear momentum of a system is equal to the vector sum of the external forces.

(PTO)

(3) If the vector sum of the external forces is zero then prove that mass center of the system travels in a straight line with constant speed .

(4) Obtain equation of path of projectile in the form $y = x\tan\alpha\left(1-\frac{x}{R}\right)$, where R is horizontal range .

(5) For projectile motion, prove that $gT^2 = 2R\tan\alpha$.

(6) If R is maximum horizontal range of the projectile, prove that a point whose horizontal and vertical distances are R/2 and R/4 resp., lie on the path provided that the tangent of angle of projection is 1 or 3.

(7) Find the law of force towards the pole for the curve described by the equation $r = ae^{\theta\cot\alpha}$.

(8) State the laws of the inverse square and Kepler's laws .

(9) Find the moment of inertia of a thin hoop of mass m and radius a about line passing through the center and perpendicular to its plane .

(10) A sphere impact directly in the equal sphere which is at rest. Show that their velocities after impact are in ratio $1-e:1+e$, where e is the coefficient of restitution .

(11) State and prove Principle of angular momentum relative to impulsive force .

(12) A sphere of mass 1 kg moving with 3 m/sec overtake another sphere of mass 5 kg moving in a same direction with 60 cm/sec. Show that the direction of motion of first sphere is reversed when e = 0.75.

Que.3 (a) State and prove principle of conservation of energy for particle . 5

(b) State and prove principle of angular momentum of a system relative to the mass center . 5

OR

Que.3 (a) Verify the principle of conservation of energy, if a particle of mass m falling vertically downward under the force of gravity. 4

(b) State and prove principle of energy of system . 3

(c) State and prove law of motion of system relative to the mass center . 3

Que.4 (a) A particle of mass m is projected in a vertical plane through the point of projection with velocity v_0 in the direction making an angle α with the horizontal axis .Show that the path of projectile is parabola. 5

(b) A particle of mass m is projected vertically upward in medium for which resistance R is mk^2v^2. If the initial velocity is v_0 then show that the particle returns to the point of projection with velocity v_1 such that $\frac{1}{v_1^2} = \frac{1}{v_0^2} + \frac{k^2}{g}$. 5

OR

Que.4 (a) Obtain the equation of motion of projectile with resistance in the form

$$x = x_0 + u_x\,t - \frac{1}{2}\,\phi\,u_x\,t^2 \quad ; \quad y = y_0 + u_y\,t - \frac{1}{2}\,g\,t^2 - \frac{1}{2}\,\phi\,u_y\,t^2\left(1-\frac{gt}{3\,u_y}\right).$$ 6

(b) A gun mounted on hill of height h above a level plane. Show that if the resistance of air is neglected then the greatest horizontal range for given muzzle velocity v_0 is obtained by firing at an angle of elevation α such that $cosec^2\alpha = 2\left(1+\frac{gh}{v_0^2}\right)$. 4

Que.5 (a) If a particle moves in a central orbit under inverse square law then prove that its orbit is conic . 6

(b) State and prove the theorem of *KÖNIG*. 4

OR

Que.5 (a) By using theorem of parallel axes find moment of inertia of a rod of mass m and length $2a$ attached at one end with a sphere of mass M and radius b about a line through one end perpendicular to the rod . 4

(b) Find the speed v at any point of the orbit in terms of a radius vector . 3

(c) Obtain the differential equation of the orbit of the particle moving under the attractive central force P per unit mass . 3

Que.6 (a) A series of n - elastic spheres of masses $1, e, e^2, \ldots, e^{n-1}$ are at rest separated by intervals with their centre in the straight line.The first made to collide directly to the second ball with velocity u . Show that the first $n-1$ spheres will move with the same velocity $(1-e)u$ and the last with velocity u . Also prove that kinetic energy of the system is $\frac{1}{2}(1-e+e^n)u^2$. 5

(b) The mass of three spheres A, B and C are $7m$, $7m$ and $1m$ and their coefficient of restitution is unity.Their centers are in a line and C lies between A and B. Initially A and B are at rest and C is given a velocity along the line of center towards A. Show that it strikes A twice and B once. Also prove that the final velocities of A, B and C are in the ratio $21 : 12 : 1$. 5

OR

Que.6 (a) A sphere collides directly to an equal sphere which is at rest , show that the fraction $\frac{1}{2}(1-e^2)$ of the original kinetic energy is lost during the impact . 5

(b) A particle falls from height h on a horizontal plane and rebounds continuously .Show that the whole distribution by particle is $\frac{h(1+e^2)}{1-e^2}$ and whole time before it comes to rest is $\sqrt{\frac{2h}{g}}\left(\frac{1+e}{1-e}\right)$. 5

(52 & A-28) Seat No :_____ No. of Printed Pages 2

SARDAR PATEL UNIVERSITY

B.Sc. EXAMINATION (Semester- 6)

Monday, 27th March2017

10:00 a.m. to 01:00 p.m.

Subject: PHYSICS

Course: US06CPHY01

Title: Quantum Mechanics

Total Marks:70

N.B: *(i) All the symbol have their usual meanings*
(ii) Figures at the right side of questions indicate full marks

Q-1 Multiple Choice Questions (Attempt All) **(10)**

(1) The function representing matter waves must be _____
(a) complex (b) real
(c) zero (d) infinity

(2) The normalized wave function must have _____ norm
(a) infinite (b) zero
(c) finite (d) complex

(3) The group velocity can be obtain using _____ series
(a) Fourier (b) Taylor
(c) Laplace (d) Norton

(4) According to the wave function and it first partial derivative should be _____ functions for all values of $\vec{X}$
(a) zero (b) continuous
(c) infinity (d) discontinuous

(5) Any particle with energy _____ cannot enter in the regions I and III
(a) $E = 0$ (b) $E = \propto$
(c) $E < 0$ (d) $E > 0$

(6) There exists at least _____ bound state, however weak the potential may be
(a) two (b) one
(c) three (d) infinite

(7) If $\delta_{m,n}$ is Kronecker delta function then $\delta_{m,n} = 0$ when _____
(a) $m = n$ (b) $m < n$
(c) $m > n$ (d) $m \neq n$

(8) Position operator in a momentum space is given by r_{op} = _____
(a) $i\hbar\vec{\nabla}_p$ (b) $i\hbar r_{op}$
(c) $i\hbar k$ (d) $i\hbar p$

(9) In a rigid rotator distance between two particles is _____
(a) variable (b) zero
(c) infinite (d) constant

(10) Central potential is a function of _____
(a) r only (b) θ only
(c) Ø only (d) r and θ only

Q-2 **Short Questions (Attempt any Ten)** **(20)**

(1) State the de Broglie hypothesis
(2) What is wave packet?
(3) What you mean by $|\Psi|^2$
(4) What is square well potential?
(5) What is square potential barrier?
(6) Prove that $[x, p] = i\hbar$
(7) Explain adjoint operator. Also define self adjoint operator
(8) What are observables?
(9) State the significance of expansion coefficients
(10) Write the expression of operator L^2
(11) Draw the energy level diagram of simple harmonic oscillator
(12) What is Isotropic oscillator? Write the expression of its energy eigen value

Q-3 (a) With necessary diagram discuss the concept of wave packet and derive the expression $v_g = \frac{d\bar{w}}{d\bar{k}}$ **06**

(b) Discuss the Heisenberg's uncertainty principle and show how it is introduced in the process of measurement **04**

OR

Q-3 (a) Discuss the expectation values of variables and prove Ehrenfest's theorem **06**

(b) Show that total probability is conserved **04**

Q-4 Derive the admissible solution for a particle in a square well potential for $E < 0$ **10**

OR

Q-4 Derive the expression of energy eigen values for a particle in a square well. Also find the expression of even and odd eigen function **10**

Q-5 (a) Derive the delta function normalization momentum eigen functions **06**

(b) Write note on : Dirac delta function **04**

OR

Q-5 (a) Derive the uncertainty principle for quantum mechanical observables **06**

(b) Prove that the same state of all the component of $\vec{L}$ is impossible **04**

Q-6 (a) Set up the Schrodinger equation for simple harmonic oscillator and derive the expression if its energy eigen value $E = \hbar\omega\left(n + \frac{1}{2}\right)$ **06**

(b) Derive the Schrodinger equation of anisotropic oscillator **04**

OR

Q-6 (a) Derive the radial Schrodinger equation for motion of a particle in central force field **06**

(b) What is rigid rotator? Show that its energy levels are not equispaced **04**

— X —

(32A & A-28) Seal No.:_____ No. of pages: 2

SARDAR PATEL UNIVERSITY
B. Sc, 6th Semester
Tuesday, 28th March 2017
Session: Morning, Time: 10:00 AM to 01:00 PM
Subject Code: (PHYSICS) US06CPHY02
Subject Title: Atomic-Molecular Physics, Energy Science and Earth Science
Max Marks: 70

NB: (i) All the symbols have their usual meanings.
(ii) Figures at the right side of questions indicate full marks.

Que: 1 Write correct answer for each of the following MCQs. [10]

1 The Lyman series of hydrogen spectrum lies in the _____ region of the spectrum.
a) Ultra -violet b) X- rays
c) visible d) infra - red

2 The arrangement of any physical quantity either in increasing or decreasing order is called _____ of that quantity.
a) spectrum b) wavelength
c) energy d) frequency

3 The valiancy of alkali element is _____.
a) two b) one
c) four d) three

4 The band spectra are also known as _____ spectra
a) line b) molecular
c) atomic d) X- rays

5 In Raman effect, the scattered lines having same frequency as that of incident line is known as _____ line.
a) Stoke b) Anti-Stoke
c) Rayleigh d) Balmer

6 Power delivered by a solar cell is maximum at _____.
a) Knee point b) Short circuit point
c) Open circuit point d) None of these

7 The shadow factor _____ during noon when angle of elevation of sun is nearly 90°.
a) 100 b) 1
c) 1000 d) 10

8 The continental crust mainly consists of _____.
a) Sand stones b) Tholeiitic basalt
c) Igneous rocks d) Ozone

9 A ____ is an instrument used to record the earth tremors.
a) Spectrometer b) Pyrometer
c) Seismogram d) Seismograph

10 The maximum efficiency of a propeller type wind turbine is ____ % .
a) 59 b) 79
c) 57 d) 49

(1) (P.T.O.)

Que 2 **Write answers of any ten questions in brief.** **[20]**

1 Classify various types of spectra.
2 State Ritz-Combination principle.
3 What are positroniums?
4 What is Born-Oppenheimer approximation?
5 Differentiate between Raman spectra and Fluorescence spectra.
6 State the salient features of pure rotational spectra.
7 On which factors does the efficiency of a solar cell depend?
8 Draw the schematic diagram of a Solar Thermal Electrical Power Plant.
9 Give the planning of a wind farm.
10 Enlist different types of minor plates.
11 Explain in brief plate boundary zones.
12 Derive formula to determine density of the earth.

Que 3 [A] Explain the different series of spectra for hydrogen atom in terms of wave numbers. **[05]**

[B] What is the importance of Frank –Hertz experiment? Explain Frank-Hertz experiment with proper diagram. **[05]**

OR

Que 3 [C] What is the importance of Stern-Gerlach experiment? Explain the Stern-Gerlach experiment with proper diagram. **[05]**

[D] What are alkaline elements? State the electronic configuration of these elements in terms of inert core elements. **[05]**

Que 4 [A] What is Raman effect? State the salient features of Raman spectra. With necessary diagram, explain the laboratory experimental set-up to observe it. **[10]**

OR

Que 4 [A] Define a rigid rotator and a non- rigid rotator. Derive the equation for rotational energy of it. Also explain the isotope effect in rotational spectra. **[10]**

Que 5 [A] With necessary diagram explain mono blade horizontal axis wind turbine generator. **[05]**

[B] Write a note on Fuel cell in detail. **[05]**

OR

Que 5 [C] Which factors do influence voltage and power delivered by the solar cell? With necessary diagrams explain V→ I characteristics of a solar cell. **[05]**

[D] Give classification of solar energy conversion systems with regard to temperature. Name four important systems of solar energy conversion plant. **[05]**

Que 6 [A] Explain the term: The Core and Give its chemical composition and influence. **[06]**

[B] Discuss the plate boundaries with proper diagram. **[04]**

OR

Que 6 [C] What are seismographs? Explain in brief vertical pendulum and horizontal pendulum type of seismographs. **[06]**

[D] Name the three main layers of the earth. Give the chemical composition of Mantle. **[04]**

* * * * *

(49 & A-27) SEAT No._____ No. 2 No. of pages: 2

SARDAR PATEL UNIVERSITY
B. Sc, 6th Semester
Friday, 31st March 2017
Session: Morning, Time: 10:00 to 01:00 PM
Subject Code: (PHYSICS) US06CPHY03
Subject Title: Nuclear Physics

Max Marks: 70

Que: 1 **Write correct answer for each of the following MCQs.** [10]

1 Method of Mesonic X-ray is used to estimate_____ of nucleus.
a) spin
b) magnetic moment
c) radius
d) electric quadruple moment

2 1 barn = _____ cm^2.
a) 10^{-14}
b) 10^{-24}
c) 10^{-34}
d) 10^{-28}

3 Electrons obey _____ statistics.
a) Fermi-Dirac
b) Bose-Einstein
c) Maxwell-Boltzmann
d) Both (a) & (b)

4 Typical life span of a compound nucleus is approximately _____seconds.
a) 10^{-26}
b) 10^{-16}
c) 10^{-6}
d) 10^{16}

5 Which of the following is not a type nuclear reaction?
a) scattering
b) stripping
c) oxidation
d) pick-up

6 In which nuclear process neutron emission takes place?
a) positive β-decay
b) negative β-decay
c) electron capture
d) none of above

7 Type of disintegration in which two lighter nuclei merge together and form a medium size nucleus is called _____.
a) fusion
b) fission
c) α-decay
d) β-decay

8 The ratio of the total number of ion pairs in the primary ionization to that in the secondary ionisation is known as _____factor.
a) Gas division
b) Gas multiplication
c) Gas subtraction
d) Gas addition

9 The principle of _____are used in LINACS for accelerating particles.
a) phase stability
b) phase matching
c) Both (a) and (b)
d) phase switching

10 The vertical and radial motions of particles in cyclotron are called ____ oscillations.
a) synchrotron
b) cyclotron
c) radial
d) betatron

Que 2 **Write answers of any ten questions in brief.** **[20]**

1. Giving examples, define mirror nuclei.
2. Define: Isobars and Isomers.
3. Draw a labeled diagram of Aston's mass spectrograph.
4. With example explain pickup nuclear reaction.
5. For the reaction $_{92}U^{234} \rightarrow {}_{90}U^{230} + {}_{2}He^{4}$ obtain Q-value using isotopic masses.
6. For A = 220; values for $\frac{d(B/A)}{dA}$ is $\frac{-1}{110}$ and for $\frac{B}{A}$ is 7.7 MeV. Calculate nucleon separation energy for the nucleus.
7. Explain fission of lighter nuclei.
8. Calculate the amount of energy released from fission of 50 gram of $_{92}U^{235}$.
9. Draw experimental setup of NMR.
10. For ionization counter draw the graph of anode signal Vs. anode voltage showing GM counter region.
11. Give the advantages and disadvantages of photographic emulsion detector.
12. Briefly explain the principle of cyclotron.

Que 3 **[A]** With necessary diagram, explain the use of Dampsters' mass spectrometer to estimate relative abundance of various isotopes. **[06]**

[B] Write a note on nuclear magnetic moment. **[04]**

OR

Que 3 **[A]** With different arguments, explain non-existence of electron within the nucleus. **[06]**

[B] Explain "parity", the wave mechanical property of a nucleus. **[04]**

Que 4 For a nuclear reaction x + X → Y + y, obtain an expression which shows balance of mass and energy. Also derive Q-value equation for two body nuclear reaction in two dimensions. **[10]**

OR

Que 4 Obtain volume energy, surface energy, coulomb energy and paring energy term of Weizsacher's semi-empirical mass formula. **[10]**

Que 5 **[A]** Write a detailed note on asymmetrical fission mass yield. **[06]**

[B] Explain in detail the use of radioisotopes in medicine. **[04]**

OR

Que 5 **[A]** Define the term NMR and explain experimental set up for it. **[06]**

[B] Write a note on nuclear bleeder reactor. **[04]**

Que 6 **[A]** Discuss the Geiger-Muller counter with labelled diagram. **[06]**

[B] Explain the ionization chamber with necessary diagram. **[04]**

OR

Que 6 **[A]** Write a detailed note on 'gas filled ionization detector'. **[06]**

[B] Explain drift tube LINACS. **[04]**

* * * * *

— X —

(2)

SEAT No._____

No. of pages: 2

[49A27]

SARDAR PATEL UNIVERSITY
T.Y. B.Sc, 6th Semester
Monday, 03rd April, 2017
Session: Morning, (PHYSICS) US06CPHY04
Subject Title -Electrodynamics & Plasma Physics
Time : 10.00am to 01.00pm

Total Marks:70

Que: 1 **Write correct answer for each of the following MCQs.** [10]

1 The resultant field inside the conductor is _____.
   a) one
   b) infinite
   c) zero
   d) none

2 Capacitor is a device which is use for storing _____ energy.
   a) solar
   b) electric
   c) magnetic
   d) mechanical

3 When a sample is placed in a region non-uniform magnetic field, the diamagnetic is _____ away.
   a) repelled
   b) attracted
   c) steady
   d) none

4 H plays a role in magneto statics analogous to _____ in electrostatics.
   a) V
   b) D
   c) E
   d) F

5 Conductivity decreases with increasing _____.
   a) force
   b) work
   c) energy
   d) temperature

6 The magnetic flux through the larmor orbit is _____.
   a) decreases
   b) increases
   c) constant
   d) none

7 KT = 2ev, So E_{av} = _____.
   a) $\frac{1}{2}$ ev
   b) $\frac{3}{2}$ ev
   c) 3ev
   d) 2ev

8 The _____ is a tenuous plasma with temperature up to 200ev
   a) Solar eclipse
   b) Lunar eclipse
   c) Solar corona
   d) Crab nebulae

9 $P = Cp^{\gamma}$, where γ = _____.
   a) $\frac{Cp}{Cv}$
   b) $\frac{Cv}{Cp}$
   c) Cp.Cγ
   d) Cp +Cγ

10 Diamagnetic drift V_D = _____.
   a) $\frac{\nabla p \times B}{qnB^2}$
   b) $\frac{-\nabla p \times B}{qnB^2}$
   c) $\frac{\nabla \times B}{qnB^2}$
   d) $\frac{-\nabla p \times B}{qn}$

(PTO)

Que 2 **Write answers of any ten questions in brief.** **[20]**

1 Define : (1)Polar molecules (2) non-polar molecules
2 Explain: polarization.
3 Give boundary condition for electric displacement.
4 Explain: Ohm's law.
5 Deduce Faraday's law.
6 Define: Electromotive force.
7 Enlist the applications of Plasma.
8 Explain: Loss cone.
9 Explain: Orbit theory.
10 Write down Maxwell's equations(in esu) in vacuum and in medium.
11 Which phenomenon is called "Langmuir's paradox"?
12 Calculate the approximate value of plasma frequency if density n $=10^{12}\,cm^{-3}$.

Que 3 **[A]** What happens to a neutral atom when it is placed in an electric filed **E** ? **[05]**

[B] What happens when dipole is placed in uniform and non uniform electric filed **E** ? **[05]**

OR

Que 3 **[C]** Solve Laplace's equations using the method of separation of variable with spherical polar co-ordinates. **[07]**

[D] Calculate the averaged macroscopic field for points inside the dielectric. **[03]**

Que 4 **[A]** What field does a piece of magnetised material produced in terms of bound currents? **[05]**

[B] Give physical interpretation of bound currents. **[05]**

OR

Que 4 **[C]** Prove that effect of magnetic field on Atomic orbits Change the dipole moment is $\Delta m = \frac{1}{2}e(\Delta v)R\hat{Z} = \frac{-e^2R^2}{4m_e}\mathbf{B}$. **[05]**

[D] Deduce Neumann formula and discuss back emf. **[05]**

Que 5 **[A]** Explain in detail Debye shelding and derive the formula for debye length(λ_D). **[10]**

OR

Que 5 **[B]** Explain Magnetic mirrors. **[10]**

Que 6 **[A]** Deduce an equation of diamagnetic drifts when fluid drifts perpendicular to **B**. **[06]**

[B] Obtain an equation of Boltzmann relation for electrons when fluid drift parallel to **B**. **[04]**

OR

Que 6 **[C]** For an Ion waves derive the velocity of sound plasma. **[04]**

[D] Compare the dispersion curves for electron plasma waves and ion acoustic waves and discuss "validity of plasma approximation". **[06]**

* * * * *

No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

SEAT No._____ Sixth Semester B. Sc. Examination

[25A]

8th April-2017

Time: 10:00 A.M. To 01:00 P.M.

Subject: PHYSICS [**US06CPHY05**]

Digital Electronics, Electronic Communication & VLSI Technology

Total Marks 70

N.B: (i) All the symbols have their usual meanings.
(ii) Figures at the right side of questions indicate full marks.

Que.-1 **To answer the multiple choice questions choose the correct option.** [10]

1. Which number system has a base of 16?
   (a) octal (b) decimal (c) binary (d) hexadecimal
2. Complement of NOR and OR gates is _____ and _____ respectively.
   (a) AND, NAND (b) NAND, AND (c) NOR, OR (d) OR, NOR
3. If the inputs of OR gates are connected with NOT gates, the output will be the same as _____
   (a) NOR gate (b) NAND gate (c) EX-OR gate (d) AND gate
4. A flip flop is ____state device.
   (a) 4 (b) 8 (c) 16 (d) 2
5. A shift resister which is used to shift a bit left or right uses_____.
   (a)diodes (b) transistors (c) resistors (d) flip flops
6. The working of flip flop is equivalent to _____.
   (a) bistable multivibrator (b) astable multivibrator
   (c) monostable multivibrator (d) amplifier
7. For ideal amplitude modulation process _____is true.
   (a) m=1 (b) m<1 (c) m>1 (d) m=0
8. A device whose capacitance is deliberately made to be a function of the applied voltage is _____.
   (a) UJT (b) varactor diode (c) LDR (d) LED
9. When _____ is placed in close contact with an n-type semiconductor, Schottky barrier is created.
   (a) insulator (b) semiconductor (c) metal (d) p-type material
10. The MOS capacitor is a non polarized capacitor which can be operated with_____.
    (a) positive voltage (b) no voltage
    (c) negative voltage (d) positive or negative voltage

Que.-2 **Answer *briefly* any ten of the following questions.** [20]

(1) Explain briefly about ASCII code.
(2) Verify de Morgan's theorems with the help of truth table.
(3) Implement EX-OR gate using basic gates.
(4) Explain in brief D flip-flop.
(5) Explain working of JK Master-Slave flip flop briefly.
(6) What is the drawback of ripple counter? Give its remedy.
(7) Define modulation and modulation index.
(8) Explain in brief duplex communications with examples.

(P.T.O.)

(9) For AM signal, if V_{max} value read from oscilloscope screen is 3.5 divisions and V_{min} is 0.5 divisions then calculate the value of modulation index m.

(10) Explain briefly different levels of integration of IC chips.

(11) Give the cross-sectional view of a Schottky diode fabricated on IC.

(12) State the advantages of MOS technology over bipolar technology in IC fabrication.

Que.-3 (a) Describe the working of two inputs OR gate and AND gate with suitable circuit diagram. [06]

(b) (i) Convert the following binary numbers into Hexadecimal numbers [04]
(1) 110010100101 (2) 1111110001
(ii) Convert the following binary numbers into decimal numbers
(1) 11010 (2) 1101101

OR

Que.-3 (a) Explain the working of two inputs TTL NAND gate with suitable circuit diagram. How is the speed improved with the Schottky TTL? [06]

(b) Describe the working NOT gate with suitable circuit diagram. [04]

Que.-4 What is a flip flop? With suitable logic diagram explain the working of clocked RS flip-flop and JK flip-flop. [10]

OR

Que.-4 Explain the working of 4 bit binary ripple counter with suitable logic diagram and clock waveform. How it can be converted to Mod 10 counter. [10]

Que.-5 (a) What do you mean by communication? Draw the block diagram of any communication system and explain function of each of its elements. [06]

(b) What are sidebands? Explain four major benefits of using single sideband communication. [04]

OR

Que.-5 (a) With necessary diagrams, explain how FM and PM differ? [06]

(b) Explain the working of AM diode circuit with necessary diagrams. [04]

Que.-6 (a) Explain the basic configurations of transistor used for diode operation in the monolithic IC with fabrication diagram. [06]

(b) Discuss the use of junction capacitors for the fabrication in monolithic IC [04]

OR

Que.-6 (a) With proper diagram explain how n-channel JFET integrated on IC chip. [06]

(b) Discuss the general classification of integrated circuits and mention their advantages over discrete components. [04]

========XXX========

[34PA25] SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY VALLABH VIDYANAGAR

B.Sc. (Physics) Semester-VI (2011Batch onwards CBCS) Examination: **April 2017**
Subject Code: **US06CPHY06** Subject Title: **Instrumentation and Sensors**
Date: 07-04-2017 Friday **Time: 10.00 a.m. to 01.00 p.m.** **Marks: 70**

Q. 1 Answer the following MCQs with correct option: (Each of 1 Mark) **(10)**

1. Which of these is used to convert input physical variable into useful energy?
   (a) rectifier (b) transducer (c) transformer (d) amplifier
2. Which of the following can be used to measure the frequency of ac signal?
   (a) oscillator (b) CRO (c) voltmeter (d) ammeter.
3. In LVDT the transformer core is generally made up of
   (a) hard iron core (b) soft iron core (c) high permeability steel (d) steel
4. The limb of inclined tube manometer is kept inclined at angle of ... .
   (a) 25^0 (b) 30^0 (c) 35^0 (d) 45^0
5. A Solar cell is a ..... type of transducer.
   (a) photo-conductive (b) photo-voltaic (c) photo-emissive (d) ionization
6. Which of these gages is based on Boyle's law?
   (a) Knudsen (b) ionization (c) McLeod (d) pirani
7. The most suitable primary sensor for temperature measurement is .....
   (a) bimetallic strip (b) diaphragm (c) elastic cantilever (d) bourdon gage
8. Which of the followings exhibits negative temperature coefficient of resistance?
   (a) Nickel (b) thermistor (c) Platinu (d) copper
9. Which type of microphone is used in telephone transmission circuit?
   (a) Condenser (b) Piezoelectric (c) Carbon (d) Electrodynamic
10. Which of the following is used as an enzyme in a blood glucose monitor?
    (a) H_2O_2 (b) gluconic acid (c) glucose (d) glucose oxidase

Q.2 Answer any TEN of the following questions in short: (Each of 2 Mark) **(20)**

1. Explain principle of measurements with electromechanical transducers.
2. Draw labeled block diagram of a Cathode Ray Oscilloscope.
3. With schematic diagram explain principle of thermal conductivity or pirani gage.
4. Draw the schematic of photo-emissive transducer and state its principle.
5. Draw the schematic of photo-voltaic transducer and state its principle.
6. What is a thermocouple? Explain seeback effect.
7. What are thermistors? State their features.
8. What is a total radiation pyrometer? State its principle.
9. Draw schematic of Electrodynamic microphone and name its parts.
10. Draw schematic of Carbon microphone and name its parts.
11. What is a bio-sensor? Sate its features.
12. Find the displacement sensitivity of a capacitive transducer with diameter of each plate being 2 cm and an air gap of 0.25mm between the plates.

(P.T.O.)

Q.3(a) State principle of inductive type transducers. Classify them and explain various types of inductive transducers. (10)

OR

Q.3(a) What is a cathode ray oscilloscope (CRO)? Show that in cathode ray tube of a CRO, path of an electron reaching the screen is parabolic. Explain its deflection factor. (10)

Q.4(a) With necessary diagram explain various types of manometers for Moderate pressure measurements. (06)

(b) With schematics explain working principle of ionization gage. (04)

OR

Q.4(a) Explain principle construction and working of a McLeod gage. (06)

(b) With schematics explain working principle of Knudsen gage. (04)

Q.5(a) State non-electrical methods for temperature measurements. Explain Metal expansion thermometer with schematics. State its applications. (06)

(b) Explain bimetallic type of thermometers. (04)

OR

Q.5(a) Explain construction and working of disappearing filament type of Optical pyrometer. (06)

(b) Draw construction of a solid rod thermometer and state its principle. (04)

Q.6(a) Draw schematic of Orsat apparatus for exhaust gas analysis and Explain its application. (06)

(b) Why optical fiber sensors are important in medical field? Explain. (04)

OR

Q.6(a) Draw construction of non-dispersive infra-red gas analyzer. Explain its principle. (06)

(b) Write a note on Condenser type of Microphone. (04)

xyx

(53) Seat No.:_____ No. of Printed Pages : 2

Sardar Patel University
B. Sc. Semester VI Examination 2017
Vertebrata
US06CZOO 01
27th March, 2017, Monday
10:00 am to 1:00 pm

Total Marks: 70

QI Multiple Choice Questions. **[10]**

1. Test is present in _____.
   a. hemichordata b. cephalochordata
   c. urochordata d. all of these
2. Wheel organ is a part of_____.
   a. pharynx b. velum
   c. mouth d. oral hood
3. Which one of the following is considered as an accessory respiratory organ?
   a. skin b. pelvic fins
   c. pharyngeal diverticula d. all of these
4. In Shark, heart is _____ chambered.
   a. four b. three
   c. two d. one
5. Uromastix is commonly known as _____.
   a. girgit b. spiny tailed lizard
   c. wall lizard d. flying lizard
6. Tail in Scoliodon is
   a. homocercal b. heterocercal
   c. hypercercal d. hypocercal
7. The only cutaneous glands in Pigeon is
   a. uropygial b. sweat
   c. sebaceous d. mammary
8. Which one of the following is truly called the age of Reptiles?
   a. carboniferous b. palaeozoic era
   c. mesozoic era d. archeozoic era
9. Which one of the following is an oviparous mammal?
   a. hystrix b. duck bill platypus
   c. armadillo d. hedge hog
10. Which one belongs to mammal like reptiles?
    a. lacertilia b. rodentia
    c. therapsida d. none of these

[P.T.O]

QII Answer the following in short.(Attempt any Ten) [20]

1. Compare the mode of feeding in sub phylum protochordata.
2. Name the sense organs found in Amphioxus.
3. Write about respiratory system of Amphioxus.
4. Explain the term Neotany and Paedogenesis.
5. Name the body apertures of Scoliodon.
6. Write about breeding in Uromastix.
7. Name the flightless birds.
8. Write about Tyrannosaurus rex dinosaur.
9. Draw and label flight feather of Pigeon.
10. Write about spiny ant eater.
11. Draw and label the external characters of Rat.
12. Write about the buccal cavity of Rat.

QIII Write notes on : a. Types of swim bladder. [06]
b. Protonephridia of Amphioxus [04]

OR

QIII Describe : a. The external characters of Amphioxus. [06]
b. Types of fins. [04]

QIV a. Describe the structure and functions of heart of Scoliodon. [07]
b. Write about the male reproductive system of Uromastix. [03]

OR

QIV a. Describe the digestive system of Uromastix. [07]
b. Write about adaptations for amphibious life. [03]

QV Write notes on : a. Types of Feet [05]
b. Herbivorous Dinosaurs [05]

OR

QV Write notes on : a.Female reproductive system of Pigeon [05]
b. The superiority of birds over reptilian ancestors [05]

QVI Describe the male urinogenital system of Rat. [10]

OR

QVI Describe the aquatic mammals and their adaptations for aquatic life. [10]

— X —

(33A) Seat No.:_____ No. of Printed Pages : 2

Sardar Patel University
B. Sc. Semester VI Examination 2017
Comparative anatomy of chordates
US06CZOO 02
28th March,2017, Tuesday
10:00 am to 1:00 pm

Total Marks : 70

QI Multiple Choice Questions. **[10]**

1. The sound producing organ of birds is
   a. larynx b. syrinx
   c. pharynx d. all of these
2. Velum is present in
   a. cyclostomes b. pisces
   c. amphibians d. reptiles
3. How many gill slits are present in Shark?
   a. 4 pairs b. 6 pairs
   c. 5 pairs d. 7 pairs
4. Functional unit of kidney is
   a. neuron b. glomeruli
   c. renal corpuscles d. nephron
5. The copulatory organ, hemipenis is present in
   a. frog b. calotes
   c. pigeon d. rat
6. Terminal nerves are numbered
   a. 0 b. X
   c. III d. V
7. The receptors for sense of touch are known as
   a. thermoreceptors b. photoreceptors
   c. tangoreceptors d. phonoreceptors
8. The outer most coat of the eye ball is known as
   a. cornea b. sclera
   c. retina d. uvea
9. Interstitial cells of Leydig are located in
   a. testis b. ovary
   c. thyroid d. adrenal glands
10. Which one of the following is known as heterocrine gland?
    a. liver b. ovary
    c. thyroid d. pancreas

[P.T.O]

QII Answer the following in short.(Attempt any Ten) [20]

1. Explain the role of blood in respiration.
2. Write about phases of respiration.
3. Name the accessory respiratory organs.
4. Name the types of kidneys.
5. Write about urinary bladders of vertebrates.
6. Draw and label the T.S. of mammalian ovary.
7. Name the subdivisions of human brain.
8. Write about olfactory organs in vertebrates.
9. Draw and label the diagram of human eye.
10. Write about the pancreas of vertebrates.
11. Explain the role of placenta in mammals.
12. Write about the parathyroid glands of mammals.

QIII a. Describe the anatomy of internal and external gills with diagram. [07]
b. Write a note on Trachea [03]

OR

QIII a. Describe the condition of air bladder in ganoid, dipnoid and teleost fishes and add a note on their functions. [07]
b. Write about the lungs of mammals. [03]

QIV Write notes on: a. Mesonephros and metanephros kidneys [07]
b.Copulatory organs of higher vertebrates [03]

OR

QIV a. Write about comparative anatomy of ovaries and oviducts. [07]
b. Describe the anatomy of Pronephros kidneys. [03]

QV Describe the classification of sense organs and gustatory receptors. [10]

OR

QV Write an essay on cranial nerves of vertebrates. [10]

QVI Write notes on: a. General account of Adrenal glands [05]
b. Comparative anatomy of Testis [05]

OR

QVI Describe the general and comparative anatomy of Pituitary gland. [10]

— X —

(50) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. (VI SEMESTER)

MARCH/APRIL-2017

EVOLUTION AND APPLIED ZOOLOGY

US 06 CZOO 03

TIME: 10.0AM-1.00PM DATE: 31/03/2017 FRIDAY MARKS: 70

Q-1 MULTIPLE CHOICE QUESTIONS **[10]**

1. RECENT HYPOTHESIS IS
   A, DUST CLOUD B, ONE STAR C, TWOSTAR D, NONE
2. THE FORMATION OF HOT GASEOUS CONDENSED LATER TO FORM
   a. LIFE B. SPICES C. EARTH D. UNIVERSE
3. ORIGIN OF LIFE DESCRIBE BY.
   A, MILLER B. COASERVATES C. REDI D. NONE
4. FALSE WARNING AND SIGNALING COLOURATION ARE
   a. PROTECTIVE MIMICRY B. AGGRESSIVE MIMICRY C. ALLURING COLOURATION D. ALL
5. POTENTIAL MATES MEET BUT ZYGOTE DOES NOT FORM IS THE PROCESS OF.....ISOLATION
   a. PREVENT INTER SPECIFIC B. PREVENTING C. POST MATING D. ALL
6. HYBRID ANIMALS ARE SURVIVE THROUGH .....SELECTION
   a. NATURAL B. ARTIFICIAL C. REVERT D. COVERT
7. FISH SCALES ARE USED FOR
   a. ORNAMENTS B. PICKELS C. FISHFOOD D. ALL
8. DRAG NET USED FOR
   a. MARINE FISHING B. RIVER FISHING C. POND FISHING D. ALL
9. HONEY BEES ARE USED FOR
   a. ANTIBIOTIC REMEDY B. ANTI-INFLAMMATORY REMEDY C. ANTI-AGING D. NONE
10. PARTS OF EGG ARE
    a. SHELL B. ALBUMIN C. YOLK D. ALL

Q-2 SHORT QUESTION [ANY TEN] **[20]**

1. WRITE THEORY OF ETERNITY
2. MENTION THE MOVEMENT OF EARTH
3. PRINCIPLES OF WALLACE
4. WRITE ABOUT PREVENTINGISOLATION
5. WRITE SIGNIFICANCE OF COLOURS
6. COMMON METHODS TO SEDUCE FEMALE BY MALE BIRDS
7. QUALITIES OF PALATABLE FISHES
8. DRAW LABELED DIAGRAM OF *CATLA*
9. WRITE ABOUT PURSE NET
10. WRITE ABOUT SELECTION OF EGGS
11. WRITE ABOUT TYPES OF COWS IN DAIRY INDUSTRY
12. WHAT IS IMMUNIZATION?

(P.T.O.)

Q-3	[A] MORPHOLOGICAL EVIDENCES OF EVOLUTION	[05]
	[B] STATE THEORY OF BIOGENESIS OF ORIGIN OF LIFE	[05]
	OR	
Q-3	[A] EXPLAIN LAWS OF LAM A RCK	[05]
	[B] SUGGESTIVE THEORY OF DARWIN	[05]
Q-4	[A] EXPLAIN CHARACTERS OF SPECIES AND MODE OF SPECIATION	[05]
	[B] EXPLAIN ETHOLOGICAL ISOLATION	[05]
	OR	
Q-4	[A] STATE IMPORTANCE OF ARTIFICIAL SELECTION	[05]
	[B] EXPLAIN MICRO EVOLUTION	[05]
Q-5	DESCRIBE MARINE WATER FISHERY AND BY PRODUCT OF FISHES	[10]
	OR	
Q-5	DESCRIBE METHODS OF FRESH WATER FISHING	[10]
Q-6	LIST OUT WITH DETAIL THE PHARMACEUTICALS FROM ANIMALS	[10]
	OR	
Q-6	[A] BREEDS OF DAIRY ANIMALS	[05]
	[B] DESI BREEDS OF FOWLS	[05]

— X —

SEAT No._____ No. of Printed Pages : 2

[50]

Sardar Patel University
B. Sc. Semester VI Examination 2017
Developmental Biology
US06CZOO 04
3rd April, 2017, Monday
10:00 am to 1:00 pm

Total Marks: 70

QI Multiple Choice Questions. **[10]**

1. The eggs, which are not self sufficient to develop are known as
   a. Discoidal b. Cleidoic
   c. Determinate d. Non-cleidoic
2. Eggs which contain moderate amount of yolk are known as
   a. Alecithal b. Microlecithal
   c. Mesolecithal d. Macrolecithal
3. Artificially, parthenogenetic development of eggs can be induced by
   a. Ultraviolet light b. Various salts
   c. Temperature shocks d. All of these
4. Which type of eggs are found in Amphioxus?
   a. Macrolecithal b. Mesolecithal
   c. Microlecithal d. Polylecithal
5. In Amphioxus, wheel organ is formed during
   a. Cleavage b. Blastulation
   c. Gastrulation d. Larval development
6. Which one of the following is included in gastrulation process in Amphioxus?
   a. Invagination b.Involution
   c. Epiboly d. All of these
7. According to yolk content , the egg of frog is
   a. Microlecithal b. Mesolecithal
   c. Macrolecithal d. Alecithal
8. The second cleavage in frog is
   a. Marginal b. Horizontal
   c. Meridional d. None of these
9. What is the age of chick embryo having 7 somites?
   a. 12 hours b. 15 hours
   c. 18 hours d. 20 hours
10. The location of area pellucida in chick is
   a. Peripherally b. Centrally
   c. Marginally d. All of these

[P.T.O]

Q - II Answer the following in short.(Attempt any Ten) **[20]**

1. Write about the types of eggs according to amount of yolk.
2. Explain the term parthenogenesis and name the types of it.
3. Differentiate between determinate and indeterminate eggs.
4. Write about the gametes of Amphioxus.
5. Write about metamorphosis in Amphioxus.
6. Write about the blastula of Amphioxus.
7. Explain the changes in physiology of tadpole larva during metamorphosis.
8. Write about the functions of jelly coat in frog.
9. Explain the third cleavage in frog.
10. Write about the chemical composition of yolk in Hen's egg.
11. Write about the nature of Hen's fertilized egg.
12. Explain the fertilization in Hen's egg.

QIII a. Describe the Oogenesis in human with diagram. **[07]**
b. Write a note on importance of parthenogenesis. **[03]**

OR

QIII Describe the types of egg membranes in detail. **[10]**

QIV Describe : a. Cleavage in Amphioxus **[05]**
b. Larval development in Amphioxus **[05]**

OR

QIV Write a note on formation of primary organ rudiments in Amphioxus. **[10]**

QV a. Describe the fate map of frog embryo. **[06]**
b. Explain the blastula stage in frog. **[04]**

OR

QV a. Describe the morphological changes during metamorphosis in frog. **[06]**
b. Explain the formation of tadpole larva. **[04]**

QVI Write notes on: a. Extra embryonic membranes of chick **[06]**
b. Blastulation in chick **[04]**

OR

QVI Describe: a. 48 hours of chick embryo **[06]**
b. Cleavage in chick **[04]**

—X—

No. of Printed Pages : 2

SEAT No._____

SARDAR PATEL UNIVERSITY

[26 A]

APRIL-2017
B. Sc. Zoology VI Sem.
BIOTECHNOLOGY

US 06 CZOO 05

TIME: 10.00AM-1.00PM DATE: 05/04/2017 MARKS: 70

Q-1 Multiple Choice Questions [10]

1. The Bacterio phage is grown in radioactive medium to prove .....evidence of DNA
   a. Direct b. indirect c. gene d. non gene
2. The distance between two nucleotides.
   a. 34 A^0 b. 3.4 A^0 c. 43 A^0 d. 4.3 A^0
3. Replication of DNA is .....model
   a. conservative b. typical c. semiconservative d. disputative
4. cDNA is known as
   a. collective b. compline c. complementary d. cooperative
5. folloWing is kind of Prob
   a. c DNA b. synthetic c. RNA d. all
6. In prokaryotes generally not found
   a. Transcription b. Translation c. Translocation d. None
7. Tissue culture laboratory requires
   a. sterile area b. media c. incubator d. all
8. The meaning of vitro in IVF is
   a. laboratory b. microscope c. glass d. all
9. Transfection in Animals are called
   a. polygenic b. transgenic c. monogenic d. trigenic
10. Cancer is also called as
    a. benign b. Neoplasia c. tumour d. none

Q-2 Short Questions [Any Ten] [20]

1. Write about types of RNA
2. Draw a structure of DNA
3. Structure of 70 S RNA
4. What is plasmid as vector?
5. Write production of probe
6. Give names of four restriction enzymes and it roles
7. Write flask culture
8. Write requirement super ovulation
9. Write about embryo transfer
10. What is transgenesis?
11. Patient therapy
12. What is oncogenesis?

(PTO)

Q-3	[a] State types of Enzymes replication of DNA in eukaryotes	[05]
	[b] Explain direct evidence of DNA	[05]
	OR	
Q-3	Explain gene regulation in prokaryotes in detail	[10]
Q-4	[a] Describe PCR and its applications	[07]
	[b] Write a note on vectors	[03]
	OR	
Q-4	Write detail note on Isolation of genes	[10]
Q-5	[a] Explain Disaggregation in tissue culture	[05]
	[b] Explain embryo transfer in cattle	[05]
	OR	
Q-5	Describe treatment of patient for IVF	[10]
Q-6	Explain gene transfer in animals	[10]
	OR	
Q-6	Describe genetic counseling and related medicines	[10]

X

c72

SEAT No._____

No. of Printed Pages: 02

[35]

SARDAR PATEL UNIVERSITY

B. Sc. (ZOOLOGY) – Sixth Semester Examination

Friday, 7th April, 2017

10:00 a.m. to 1:00 p.m.

US06CZOO06: WILD LIFE AND ANIMAL BEHAVIOUR

Note: 1) Figures to the right indicate marks
2) Draw diagram wherever necessary

Total marks: 70

Q-1 Multiple Choice Questions: **[10]**

1. The animal not found only in Gujarat
   a) Lion b) Wild Ass c) Blackbuck d) Tigre
2. Which state does not have project Elephant?
   a) Rajasthan b) Orissa c) Nagaland d) Karnataka
3. Which of the following is endangered species in India?
   a) Rhinoceros b) Flying Squirrel c) Himalayan Wolf d) Spotted Dear
4. Which is one of the levels of biodiversity?
   a) Species diversity b) local level c) Extinct level d) none of these
5. Nal-sarovar sanctuary known as.....site
   a) Ramsar b) heritage c) well-known d) fishing
6. Which of the following is the social insect?
   a) Bug b) grasshopper c) beetles d) cockroach
7. Biodiversity zones are threats due to
   a) Hunting b) deforestation c) industrialization d) all of these
8. Polygamy word use in.....
   a) Deforestation b) mating strategies c) apology d) homology
9. Stickle back fish build nest for_____
   a) Mating b) protection c) feeding d) predating
10. Which of the following amphibian show parental care?
    a) Pipa b) Sea horse c) Snake d) stickle back

Q. 2 Write short Question [any ten] **20**

1. Write importance of national park and sanctuary.
2. Write the difference between wild and domestic animals.
3. Define Hot spot of India and its importance.
4. Write brief note on deforestation its?
5. Define genetic diversity with examples.
6. Write four name National Parks of Gujarat.
7. Write four names of migratory birds found in Gujarat.
8. Write brief note on polygamy with suitable example.
9. Define Statistical method in ethology.
10. Write brief note on Visuals In courtship in animals.
11. Importance of animal behavior study for animal conservation.
12. Define fertilization with suitable example.

(PTO)

Q.3	**Write notes on:**	
	a) Methods and Management of Conservation	05
	b) Gir National Park	05
	OR	
Q.3	**Write notes on:**	
	a) Lions are endangered in India	05
	b) Ecological importance of Sanctuary	05
Q.4	a) Describe wild life organizations and its importance	06
	b) Describe Pariej and Kanewal	04
	OR	
Q.4	a) Explain Biodiversity of India with its importance	06
	b) Importance of reserve wet land	04
Q.5	Define migration and explain Fish migration in detail.	10
	OR	
Q.5	Describe the social life of Bees	10
Q.6	**Write notes on:**	
	a) Courtship its characters	06
	b) Visual and Sound	04
	OR	
Q.6	**Write notes on:**	
	a) Write brief note on parental care in Fishes	06
	b) Characters dance and its importance	04

—— X ——