SEAT No._____

No. of printed pages : 02

[53]

SARDAR PATEL UNIVERSITY

M.Sc. Integrated Biotechnology (IGBT), Seventh Semester Examination
Thursday, 2nd November,
2017
2:00 p.m. to 5:00 p.m.
Environmental Chemistry : PS07CIGEB1

Total Marks : 70

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

Q.1 Choose the correct option for the following : **[08]**

(i) Holes in the ozone layer are thought to have been caused by .....
(a) CO_2 (b) CH_4 (c) CFCs (d) Space exploration

(ii) Blue baby syndrome (methaemoglobinemia) is caused by the contamination of water due to
(a) Phosphates (b) Arsenic (c) Sulphur (d) Nitrates

(iii) Inorganic phosphate forms stable complexes with .....
(a) Ca^{+2} (b) Fe^{+3} (c) Mg^{+2} (d) all of these.

(iv) Which compound is responsible for odor in water ?
(a) H_2S (b) CO (c) carbohydrate (d) metals.

(v) In ..... treatment for contaminated soil, Fe^{+2} is used along with H_2O_2.
(a) advanced oxidation (b) solidification (c) fenton treatment (d) both 'a' & 'c'

(vi) Which enzyme converts $NH_2OH \rightarrow N_2H_4$?
(a) Hydrazine oxidase (b) Hydrazine hydrolase
(c) Hydrazine reductase (d) Hydrazine carboxylase

(vii) ..... material of humic substance is not soluble in water at acidic pH.
(a) Humic acid (b) Humin (c) Fulvic acid (d) Humate

(viii) ..... enzyme hydrolyze cellulose randomly within the polymer producing smaller cellulose polymer units.
(a) β – 1,4- exoglucanase (b) β – glucosidase
(c) β – 1,4- endoglucanase (d) Cellobiase

Q.2 Answer the following (Attempt any seven) : **[14]**

(i) Write the equation showing decomposition of the O_3 by OH free radical.
(ii) How photochemical fog is formed?
(iii) How excess nutrients can kill a lake?
(iv) Define acid rain ? Enlist the pollutant responsible for acid rain.
(v) Write general biological phosphorus transformation processes.
(vi) Draw nitrogen cycle.
(vii) Write typical characteristics of anammox bacteria.
(viii) Which factors affects soil erosion ? Write mechanism of each.
(ix) Mention soil erosion preventing measures.

Q.3 Answer the following:

[A] Enlist gaseous pollutants. Describe source, reaction and adverse effect of oxides of nitrogen in atmosphere. **[06]**

PTO

[B] Explain structure and composition of atmosphere. [06]

OR

[B] Describe source, reaction and adverse effect of oxides of sulfur in atmosphere. [06]

Q.4 Answer the following:

[A] Discuss about inorganic and toxic metals as water pollutants. Also write adverse effect of it. [06]

[B] Write main physical and chemical properties of water. [06]

OR

[B] Write a note on : Pesticides pollutant. [06]

Q.5 Answer the following :

[A] What are the selection criteria for contaminated soil treatment process ? Outline chemical and physical soil treatment processes. [06]

[B] Describe soil components and chemical properties of soil. [06]

OR

[B] Explain mechanism of soil erosion. Write a note on soil erosion by wind and water. [06]

Q.6 Answer the following :

[A] Discuss sulfur oxidation and reduction processes of sulfur cycle. [06]

[B] Summarize ammonification, ammonium assimilation and nitrification processes. [06]

OR

[B] Give examples of natural carbon reservoirs. Describe carbon respiration and organic polymers of carbon cycle. [06]

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SEAT No._____ No. of printed pages: 02

[47] SARDAR PATEL UNIVERSITY

M. Sc. Integrated Biotechnology – Seven (07) Semester Examination

Monday, 06 – 11 - 2017, Time: 02:00 pm to 05:00 pm

COURSE NUMBER AND NAME – PS07CIGEB2- Ecology and Biodiversity

Maximum Marks: 70

Note: (1) All questions are compulsory. (2) Figure to right indicate marks.

Q.1 Choose the most appropriate answer from the four alternatives givens. [8]

1. .....zone, at the edge of the lake.

   (A) Littoral (B) Limnetic (C) Profundal (D) Bottom

2. In tropical rain forest, total rainfall is between.....cm per year.

   (A) 200 to 400 (B) 100 to 300 (C) 300 to 400 (D) 200 to 600

3. .....rate of a population refers to the number of individual dying per unit tim

   (A)Mortality (B) Natality (C) Both mortality and natality (D)Fecundity

4. ..... an important characteristic of population, influences both natality and mortality.

   (A) Age distribution (B) Age time (C) Age scale (D) Age pattern

5. IUCN Red List office headquarter at.....
   (A)India (B) USA (C) China (D) Russia

6. Which country it is part of 12 mega diversity of world?
   (A) Thailand (B) China (C) Pakistan (D)Canada

7. Which technique use for ex-situ conservation?

   (A) Social forestry (B) Botanical gardens (C) National parks (D) Biosphere reserves

8. Wild life populations are important for.....

   (A) Food products (B)Biological and economically (C) Medicinal use (D) Tourism

Q.2 Answer the following (Any Seven). [14]

1. Write the abiotic effects on competitions.
2. What are the freshwater biomes?
3. Define life table and populations pyramids.
4. What are the causes of sucession?
5. Explain the term endemism and hotspot of biological diversity.
6. Enlist the major causes of loss of biodiversity.
7. Write the economic important of mammals.
8. Explain the term with suitable examples of ex-situ and in-situ conservation.
9. What are the goals of environmental education?

Q.3 A. What are the terrestrial biomes? Explain any two terrestrial biomes [6]

B. Define biotic and abiotic interaction. Discuss the biotic interactions. [6]

OR

B. What is biogeography? Discuss the pattern of biogeography. [6]

Q.4 A. Explain the term population ecology. What are the characteristics of population and explain in brief with suitable example. [6]

B. Enlist the populations size regulators. Explain any three populations size regulators. [6]

OR

B. Write a short note on pattern in population dynamics. [6]

Q.5 A. Define biodiversity. What are the types of biodiversity. Explain the types with suitable example. [6]

B. Discus the uses and values of biodiversity. [6]

OR

B. Write a short note on IUCN Red Data Book. [6]

Q.6 A. Enlist the National Parks of India. What are the national parks in Gujarat and brief about any two parks. [6]

B. What is artificial insemination. Explain the techniques and its application with suitable example. [6]

OR

B. Write a short note on Environmental education programmes. [6]

(ALL THE BEST)

(121 & A-60) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
M. Sc. IGBT EXAMINATION, SEVENTH SEMESTER
PS07CIGEB3–ENVIORNMENTAL MICROBIOLOGY
8th November, 2017, 2.00 pm to 5.00 pm

Note: (i) All the questions are Compulsory.
(ii) Figures on the right indicate marks

Maximum Marks: 70

Q.1 Select the right answer for the following: 1x8= 8

(i) A population is _____.
a. A group of same species of organisms in area
b. An association of organisms with in a niche
c. All organisms are of same genus
d. Organisms found in particular altitude & latitude

(ii) Which of the chronometer is utilized for tracing microbial evolution?
a. cDNA b. mRNA c. rRNA d. tRNA

(iii) Freshwater runoff and ground water seepage interfaces with marine waters is referred as _____.
a. Wetland b. Estuary c. Salt-marsh Estuary d. None

(iv) *Nod* factors are responsible for many activities of biological nitrogen fixation except _____.
a. Root hair deformation b. Chemical recognition
c. Initiation of cell division d. Membrane depolarization

(v) Frankia species is _____
a. Free living N_2 fixer b. Symbiotic N_2 fixer
c. Asymbiotic N_2 fixer d. none of these

(vi) The term _____ is applied to the interaction of two or more populations that supply each other's nutritional needs but it is not an obligatory.
a. Mutualism b. Synergism c. Commensalism d. None

(vii) The association observes b/w tube worm *Riftia pachyptila* and bacterial population is of _____kind.
a. Mutualistic b. Synergestic c. Parasitic d. Predation

(viii) Microorganisms modify the habitat in a way that permits new populations to develop _____.
a. Autogenic succession b. Allogenic succession
c. Autotrophic succession d. Heterotrophic succession

(P.T.O.)

Q.2. Attempt any seven of the following 2x7 =14

1. Define the role of methanogenic bacteria in rumen of the ruminant animals.
2. What is a niche? How does a niche differ from a habitat?
3. Give two differences between lentic and lotic habitat.
4. Give two applications of thermophilic microbes.
5. Define three reasons for 16 s r DNA as chronological tool.
6. Define Bacteroids & explain the role of legheamoglobin.
7. Differentiate *k*-strategies and *r*-strategies.
8. Explain the role of AFLP as a tool for study of microbial community.
9. What is lichen? How can lichens grow on rocks and tree barks?

Q.3 a. Which factors favors biofilm formation? Discuss structure, role, nutrient availability and quorum sensing of biofilm microbial communities. 6

b. The atmosphere is a habitat & medium for microbial dispersal: Justify. 6

OR

b. Which factors are responsible for soil formation? Write physical, chemical and biological properties of soil. 6

Q.4 a. Define acidophiles. Discuss their physiology and applications. 6

b. Explain the method, application & limitation of ARDRA & RFLP as tool to study microbial diversity. 6

OR

b. Discuss different conventional methods to study microbial biodiversity. 6

Q.5 a. Draw well labeled diagram of Nitrogenase enzyme and discuss its regulation. 6

b. Describe characteristics of heterocyst, N_2 fixation process and activities of vegetative cell-heterocyst of cynobacteria. 6

OR

b. Discuss various factors influencing N_2 fixation process. 6

Q.6 a. Define cometabolism. Discuss cometabolism serves as a basis for commensalism with suitable examples? 6

b. Explain the difference b/w predation & parasitism. Discuss the role of dbellovibrio as an example of parasitism 6

OR

b. How do microorganisms contribute to the nutrition of ruminant animals? 6

SEAT No._____

No. of Printed Pages : 02

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SARDAR PATEL UNIVERSITY

M.Sc. (Integrated) Biotechnology

General Biotechnology – Seventh Semester Examination

PS07CIGGB1: ECOLOGY AND TOXICOLOGY

Date: 02/11/2017 **Day: Thursday**

Time: 02.00 p.m. to 5:00 p.m. **Total Marks: 70**

Note: * Draw a neat and labeled diagram, wherever necessary.
***Figures to the right indicate marks.**

Q. 1	**Choose the most appropriate answer from the four alternatives given:.**	**08**

1. Biodiversity is greatest in which biome?

(a) Taiga (b) Polar (c) Rain forest (d) Savanna

2. Most important genera of mangrove are.....

(a) *Rhizophora* and *Solanum nigrum* (b) *Rhizophora* and *Butea*

(c) *Rhizophora* and *Avicennia* (d) All of them

3. Almost all species of plants are photoautotrophs, the exceptions being parasitic plants such as.....

(a) *Orobanche spp* (b) *Cuscuta spp*

(c) Both (a) and (b) (d) *Tinospora cordifolia*

4.....is a natural change in the structure and species composition of a community.

(a) Climax of community (b) Biomes (c) Vegetation changes (d) None of them

5. DDT has long residual activity due to its stability to .....

(a) Chemical interaction (b) Light and air (c) Oxidation (d) Reduction

6. Most microorganisms are very effective at the hydrolysis of.....

(a) Esters (b) Amides (c) Epoxides (d) All of them

7. ..... is the process of programmed cell death that may occur in multicellular organisms

(a) Cancer (b) Hyper-methylation (c) Mutation (d) Apoptosis

8..... has been used as a biomarker for occupational exposure of PAH.

(a) Tetrachloroethylene (b) Acetylcholinesterase

(c) Phenanthrene (d) None of them

Q. 2	**Answer the following questions (Any seven).** 1.What are biomes? Enlist various types of biomes. 2.Write a short note on fundamental niches. 3.What do you mean by inter-relationships of ecosystems? 4.Differentiate between xeroseres and hydroseres. 5.Write a short note on: chemoautotrophs. 6.What is comparative metabolism? 7.How radioactive elements are responsible for toxicity in plants and animals. 8.Write a short note on DNA hyper methylation. 9.What do you mean by epigenetic changes due to heavy metals?	14
Q. 3	a) Write a detail note on terrestrial biomes with suitable examples. b) Give a detailed account on exclusion principle. **OR** b) Discuss in detail about marine wetlands ecosystems.	06 06 06
Q. 4	a) What do you mean by trophic levels? Describe in detail about pyramids of number and biomass. b) What is succession? Write a detailed note on patterns of succession **OR** b) Discuss in detail about carbon cycle and green house effect.	06 06 06
Q. 5	a) What do you mean by abiotic transformation? Give a detail account on photochemistry and oxidation. b) Write a descriptive note on DDT and polychlorinated biphenyls. **OR** b) Discuss in detail about mercury and lead as a heavy metals for toxicity in leaving systems.	06 06 06
Q. 6	a)What do you mean by apoptosis? How lead and cadmium are responsible for apoptosis. b) What are biomarkers? Write a note on selection of biomarker in event of toxic exposure. **OR** b)Explain in detail about global DNA hyper and hypo methylation due to heavy metal.	06 06 06

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SEAT No._____

No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY

M. Sc. (Integrated) Biotechnology – Seventh Semester Examination

[48]

Monday, 6th November, 2017

2:00p.m. to 5:00p.m.

PS07CIGGB2: Cell Biology and Cell Signaling

Note :(i) Figures to right indicate marks.
(ii) All questions are compulsory.

Total Marks: 70

Q – 1 Choose the most appropriate alternative for the followings: **(08)**

1. Water can pass the plasma membrane:
   a) by simple diffusion only
   b) by simple diffusion and through aquaporins
   c) Through aquaporins channel only
   d) Water cannot cross plasma membrane

2. The carbohydrate content of plasma membrane in eukaryotes is:
   a) 2 – 10 % by weight
   b) 20 – 25% by weight
   c) 30 – 50 % by weight
   d) 60 – 70% by weight

3. Which of the following is non-polar filament?
   a) Microtubule
   b) Intermediate filaments
   c) Microfilament
   d) None of above

4. Cells spend very short time in _____phase of cell cycle.
   a) G1
   b) S
   c) G2
   d) M

5. The signalling molecules that travel the farthest are_____.
   a) endocrine
   b) paracrine
   c) merocrine
   d) intracellular

6. In the cAMP pathway, the G protein stimulates
   a) phospholipase C
   b) adenylyl cyclase
   c) the endoplasmic reticulum
   d) Calmodium

7. Cytoplasmic tyrosine kinases are _____.
   a) Ras superfamily
   b) MAP kinase
   c) Src family
   d) TGF-β super family

8. _____ proteins are latent gene regulatory proteins that are central to stressful, inflammatory and innate immune responses.
   a) TGF β
   b) NFkB
   c) NEMO
   d) SARA

Q – 2 Attempt ANY SEVEN from the following: **(14)**

1. Write classification of membrane lipids
2. Give the name of protein complexes of Electron transport chain.
3. Write about microtubule organizing center.
4. Enlist cell junctions and write about plasmadesmata.
5. What is signal transduction? Write the basic steps of signal transduction.
6. Differentiate apoptosis and necrosis.
7. What is the role of Nitric Oxide as a second messenger?
8. What are latent gene regulatory proteins? Give any two examples.
9. What is Src family?

Q – 3 **(a)** Write a detail note on membrane proteins. **(06)**

(b) Give an overview of different mechanisms of transport of materials across the plasma membrane. **(06)**

OR

(b) Explain the structure of Nuclear Pore Complex and its role in transport between nucleus and cytosol. **(06)**

Q – 4 **(a)** Explain actin base movement in muscle contraction. **(06)**

(b) Write a note on programmed cell death. **(06)**

OR

(b) Write short note on followings:

1) Intermediate filaments **(03)**
2) Check points in cell cycle **(03)**

Q – 5 **(a)** Explain the structure and activation of G protein Receptor. **(06)**

(b) Explain the role of Inositol Triphosphate and Diacyl glycerol as second messengers. **(06)**

OR

(b) Write short note on followings: **(06)**

1) Calcium-Calmodulin Complex
2) Ion channels

Q – 6 **(a)** Explain cytokine receptors activated JAK-STAT signalling pathway. **(06)**

(b) Write an explanatory note on Ras- MAP kinase pathway for mitogenic signalling. **(06)**

OR

(b) Describe Notch-Delta signalling pathway for neural cell development. **(06)**

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

( ) Sardar Patel University
M.Sc. – IGBT, Seventh Semester
Theory examination, November 2017
Wednesday, 8th November, 2017; Time: 2:00 p.m. to 5:00 p.m.
Subject: PS07CIGGB3: Plant Biotechnology
Total Marks: 70

Notes: - 1) Figures to the right indicate marks.
2) Draw neat and labeled diagram, wherever necessary.

Q.1 Choose the Correct Answers of the Following. **[08]**

1. If vector contain CaMV35S then the gene expression will be _____.
(a) universal (b) endosperm specific (c) chloroplast specific (d) tissue specific

2. The 'nif' gene was first isolated from ..... organism.
a) *Klebsiella pneumoniae* b) *Klebsiella terrigena* c) *Bradyrhizobium* d) *Rhizobium*

3. The gene for _____plant hormone is present in Ri plasmid.
(a) Gibberellic acid (b) Ethylene (c) Auxin (d) Cytokinins

4. The genetically engineered golden rice synthesize large amount of _____.
a) Vitamin K b) β-carotene c) Vitamin C d) β-galactosidase

5. The antisense gene involved in the production of Flavr-Savr tomato.
(a) Glutathione transferase (b) Polygalacturonase
(c) Adenosine deaminase (d) None of these

6. Following is an ideal alga for chloroplast gene transfer.
(a) *Volvox* (b) *Chlamydomonas* (c) *Nostoc* (d) *Sargassum*

7. Following explant is cultured to obtain haploid plant.
(a) Embryo (b) Entire anther (c) Nucleus (d) Apical bud

8. A medium composed of chemically defined components is known as_____.
a) Artificial medium b) Natural medium c) Synthetic medium d) None of these

Q.2 Answer the following in short. (Attempt Any Seven) **[14]**

1. Explain the mechanism to deliver transgenic protein in plastid from cytoplasm.
2. Enlist applications of Ri plasmid in genetic engineering.
3. Explain- Why chloroplast is preferred over nuclear DNA for nif gene transfer?
4. Discuss the mode of action of Bt toxin on insects.
5. Explain phytase gene transfer to develop transgenic plant.
6. What is somatic embryogenesis? Write applications of it.
7. What is MS medium for plant tissue culture? Enlist components of it.

8. Write advantages of pollen culture over anther culture.

9. Give the rationale behind cloning of hirudin gene in plants.

Q.3 **[06]**

(A) Explain the natural phenomena to transfer T-DNA in plant during crown gall disease.

(B) Explain the methods for *Agrobacterium* mediated gene transfer process. **[06]**

OR

(B) Give a brief account on construction of "gene cassette". **[06]**

Q.4 **[06]**

(A) Describe endosymbiotic theory in detail.

(B) Write a short note on herbicide resistance in transgenic crops with suitable examples. **[06]**

OR

(B) Provide examples of specific vectors applied for chloroplast engineering. **[06]**

Q.5 **[06]**

(A) What is Golden rice? Explain the mechanism of Golden rice production.

(B) Enlist biochemical changes taking place during tomato ripening. Give a brief note on development of 'Flavr Savr' transgenic tomato plants using antisense RNA technology. **[06]**

OR

(B) Explain mechanism, applications and suitable examples of BT cotton. **[06]**

Q.6 **[06]**

(A) What is somatic hybridization? Explain the methods to develop somatic hybrids.

(B) Give a note on hairy root culture and secondary metabolite production. **[06]**

OR

(B) Explain steps and applications of haploid culture in brief. **[06]**

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(120, 121, 122, 123)
(A-50, A-51, A-52)

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SARDAR PATEL UNIVERSTITY

Final Theory Examination -2017

M.Sc. (INTEGRATED) BIOTECHNOLOGY- VII SEMESTER

PS07CIGGB4/PS07CIGIB4/PS07CIGEB4/PS07CIGMB4:
Advanced Molecular Biology

Date 10TH November 2017 **TIME: 2:00 to 5.00 pm**
Max. Marks: 70

Q.1 **Attempt all the questions** **1x8=8**

(i) In eukaryotic DNA replication primer synthesis is carried out by
(a) Primase enzyme (b) DNA pol α (c) DNA pol δ (d) DNA pol γ

(ii) Telomerase is related to ..... protein.
(a) DNA polymerase α (b) DNA polymerase β
(c) Reverse transcriptase (d) DNA polymerase γ

(iii) The shape of RNA polymerase resembles
(a) hand (b) Crab claw (c) Crow claw (d) none of these

(iv) Which protein(s) regulate splicing by recognizing correct splice sites?
(a) RS proteins (b) SR proteins
(c) SnRNPs (d) ADAR

(v) What is the rate of eukaryotic translation?
(a)2-4 amino acids per second (b) 20 amino acids per second
(c)10 amino acids per second (d) 50 amino acids per second

(vi) Chaperon proteins function by
(a) degrading proteins that have folded improperly
(b) providing a protective environment for proper folding of proteins
(c) providing a template for how the protein should fold
(d) all of the above

(vii) The following **is not** an example of transposable element present in *Drosophila*
(a) P element (b) FB element (c) Spm element (d) Copia element

(viii) The following is **not true** for autonomous elements
(a) Can transpose on their own
(b) insertion creates unstable allele
(c) requires transposase enzyme in *trans*
(d) replicates by cut and paste mechanism

Q.2 **Attempt <u>any seven</u> questions** **2x7=14**

(i) Write similarities and differences between prokaryotic and eukaryotic replication.

(P.T.O.)

(ii) Give the importance of ARS (Autonomously replicating sequences) in yeast.

(iii) What is promoter escape?

(iv) What do you mean by genome imprinting and epigenetic regulation of gene expression?

(v) What are introns?

(vi) What do you mean by accommodation? Give it's significance.

(vii) What are isoaccepting tRNAs? Give example.

(viii) Mention the events that can convert a proto-oncogene into an oncogene.

(ix) Enlist characteristics of P element.

Q.3	A	Explain initiation and elongation phases of eukaryotic DNA replication in detail.	**06**
	B	Discuss the mechanism for solving end replication problem of linear chromosome in eukaryotes.	**06**
		OR	
	B	Discuss the mechanism and importance of site specific recombination.	**06**
Q.4	A	(i) Give distinguishing characteristics of various RNA polymerases.	**3+3=06**
		(ii) Mention the role of general transcription factors in transcription initiation	
	B	Discuss spliceosome mediated splicing process.	**06**
		OR	
	B	What do you mean by Alternative splicing? Give example and how it is regulated?	**06**
Q.5	A	Elaborate steps of eukaryotic translation elongation with diagram.	**06**
	B	Write the mechanism of charging of tRNA along with events responsible for regulation of charging.	**06**
		OR	
	B	Write a note on protein degradation.	**06**
Q.6	A	Explain how the mutation in retinoblastoma gene can lead to development of cancer in retina.	**06**
	B	Explain Fusion-bridge cycle and its consequences in maize.	**06**
		OR	
	B	Write a note on Ac/Ds system in maize.	**06**

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SEAT No._____ No. of printed pages: 02

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SARDAR PATEL UNIVERSITY

M. Sc Integrated Biotechnology – Seven (07) Semester Examination

Thursday, 02 – 11- 2017, Time: 02:00 pm to 05:00 pm

COURSE NUMBER AND NAME –PS07CIGIB01- PLANT TISSUE CULTURE TECHNOLOGY

Maximum Marks: 70

Note: (1) All questions are compulsory. (2)Figure to right indicate marks.

Q.1 [8]

Choose the most appropriate answer from the four alternatives givens.

1. Differentiation of plants from ..... cultures have often been using as a potential method for rapid propagation.

   (A) Callus (B) Shoot (C) Root (D) Node

2. Normal plants synthesize the.....,required for growth and development.

   (A) Vitamins (B) Auxin (C) Cytokinin (D) Carbon source

3. Which method use for develop seedless triploid variety?

   (A)Endosperm culture (B)Embryo culture(C)Somatic embryogenesis culture (D)Shoot culture

4. Gynogenesis is the production of haploid plants from ..... culture.

   (A)Ovary (B)Embryo (C) Anther (D)Pollen

5. Somatic hybrid in which nucleus is derived from one parent and cytoplasm is derived from both the parents is called.....

   (A)Somatic hybridization (B)Cybrid (C) Protoplast fusion (D)Hybridization

6. Which are disadvantage of mechanical method of protoplast isolation?

   (A)Required enzymes(B)Viability of protoplast less(C)Specific tissue(D)Specific plant

7. What are the elements required for *A. tumefaciens* mediated gene transfer systems?

   (A)Plasmid (B)T-DNA (C) Chimeric gene (D)EPSP gene

8. Disarmed helper .....have been engineered by removing the oncogenic gene.

   (A)Vir gene (B)Ti plasmid (C) Ri plasmid (D) T-DNA

Q.2 Answer the following (Any Seven). [14]

1. Write the basic principle of micropropagation.
2. What the different organic and inorganic supplements required for media composition in PTC.
3. Write the application of embryo culture.
4. Write the difference of between somaclonal and gametoclonal variation
5. Enlist the different enzymes used in the protoplast isolation.
6. Write the application of micrografting method.
7. Write the disadvantages of mechanical method of isolation of protoplast.
8. What are the steps involved in the production of transgenic plants?
9. Write the role of cointegrated vectors.

P.T.O.

Q.3 A. Write the components of culture media and its roles in plant tissue culture. [6]

B. Why sterilization is required in PTC. Give the suitable examples with different explants sterilization techniques. [6]

OR

B. What are the basic procedure steps of PTC? Explain the basic procedure steps in detail. [6]

Q.4 A. Define androgenesis. Explain the process of haploid production by microspore culture. [6]

B. What are the techniques used for seedless variety production? Explain the technique. [6]

OR

B. What is somatic embryogenesis? What are the pathways through production of somatic embryogenesis? Explain the pathways. [6]

Q.5 A. What are the techniques used for identification of hybrid protoplast? Explain any three techniques. [6]

B. Explain the virus eradication technique and its advantages and disadvantages. [6]

OR

B. Write a short note on Somatic hybridization. [6]

Q.6 A. What is Ti plasmid? Write about virulence region and chromosomal gene of Ti plasmid. [6]

B. Explain the different steps involved in the production of transgenic plant and its role. [6]

OR

B. Write a short note on application of transgenic plants. [6]

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SARDAR PATEL UNIVERSITY

M. Sc. (Integrated) Biotechnology – Seventh Semester Examination

Monday, 6th November, 2017.

2:00 p.m. to 5:00 p.m.

PS07CIGIB2: ANIMAL TISSUE CULTURE TECHNOLOGY

Note: (i) Figures to right indicate marks.
(ii) All questions are compulsory.

Total Marks: 70

Q – 1 Choose the most appropriate alternative for the following: **(08)**

1. Which laminar air flow unit providing sterilization to the operator while dealing with hazards materials?
   a) Horizontal b) Vertical
   c) Both of above d) None of above
2. What concentration of CO_2 required for culturing animal cells?
   a) 2-5% b) 1-10%
   c) 10-15% d) 15-20%
3. Cells floating freely in the culture medium are known as _____ culture system.
   a) monolayer b) confluence
   c) parallel d) suspension
4. Multicellular tumor spheroids are example of _____ culture.
   a) organ culture b) histotypic culture
   c) organotypic culture d) explant culture
5. A cell lineage having specific characteristics is called.....
   a) finite cell line b) continuous cell line
   c) cell strain d) cell line
6. Followings are cryoprotactant except one
   a) DMSO b) ficoll
   c) sucrose d) glycerol
7. Hybridoma cells are fusion of _____ and _____ cells.
   a) monocytes & lymphocytes b) macrophage & plasma cells
   c) myloma cells & lymphocytes d) monocytes & leukocytes
8. Adult stem cells are also known as_____.
   a) totipotent stem cells b) pluripotant stem cells
   c) embryonic stem cell d) somatic stem cell

Q – 2 **Attempt ANY SEVEN from the following:** (14)

1. Write about source of energy in culture media.
2. Write different methods of sterilization.
3. How serum free media is better than serum containing media? Discuss.
4. Write about mechanical disaggregation techniques.
5. What are the criteria for sub culture?
6. Narrate about cell lines with example.
7. What is cross contamination?
8. Enlist various applications of MABs.
9. Enlist the sources of stem cells.

Q – 3 (a) Enlist and explain the necessary equipments required for animal tissue culture laboratory. (06)

(b) Discuss the physico-chemical properties of animal tissue culture media. (06)

OR

(b) Write short note on followings:

1) Balance salt solutions (03)
2) Explant culture (03)

Q – 4 (a) Give a detailed account on enzymatic disaggregation techniques. (06)

(b) Write a note on organ culture. (06)

OR

(b) Enlist various techniques for scale up of cultured cells and explain methods for suspension culture. (06)

Q – 5 (a) Explain cytotoxicity and viability assays. (06)

(b) Give a detailed account on various cell separation methods. (06)

OR

(b) Discuss sources and prevention methods of contamination in animal tissue culture. (06)

Q – 6 (a) Explain hybridoma technology for the production of monoclonal antibodies. (06)

(b) Describe the basic steps for cryopreservation. (06)

OR

(b) Write the method of production of attenuated vaccines. (06)

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(123) SEAT No._____ No. of printed page: [02]

SARDAR PATEL UNIVERSITY

M. Sc. Integrated Biotechnology (IG-IBT) 7th Semester
Theory Exam – November 2017
PS07CIGIB3 – Fermentation technology
08th November 2017 (Wednesday), 2:00 pm to 5:00 pm
Maximum Marks: 70

Note: (1) All the Questions are compulsory. (2) Figures on the right indicate marks.

Q.1. Choose the correct option **1x8 = 8**

(i) In fermentation media, inorganic nitrogen may be supplied as _____
[A] ammonia gas [B] ammonium salts
[C] nitrates [D] all of these

(ii) The computer control involves process control of parameters, where the sensors are directly interfaced to a computer (DDC). What is the fullform of DDC?
[A] direct data control [B] digital data control
[C] digital depth control [D] direct digital control

(iii) Genetic engineering of producer strains attempted in fermentation industry in _____year and used till date.
[A] 1940 [B] 1964
[C] 1979 [D] None of these

(iv) Penicillin G production using *Penicillium chrysogenum*, the precursor added in the fermentation medium is_____.
[A] Lactic acid [B] ρ-hydroxy phenylglycine
[C] Phenyl acetic acid [D] None of these

(v) K_La determination by dynamic methods of gassing out procedure is
[A] increasing the supply of air to the fermenter
[B] stopping the supply of air to the fermenter
[C] decreasing the supply of air to the fermenter
[D] none of these

(vi). During sterilization the Maillard-type browning reaction which results in discoloration of the medium as well as loss of nutrient quality caused by
[A] the reaction of carbonyl groups, usually from non-reducing sugars, with the amino groups of amino acids and proteins
[B] the reaction of carbonyl groups, usually from reducing sugars, with the amino groups of amino acids and proteins
[C] the reaction of carbonyl groups, usually from proteins, with the amino groups of proteins
[D] the reaction of carbonyl groups, usually from non-reducing sugars, with the amino groups of nucleotides

(vii). Which of the following device regulate and control flow of liquid and gas?
[A] Inlet Air Filter [B] Valves
[C] Exhaust point [D] Exhaust Air Filter

P.T.O.

(viii). The continuous culture are not widely used in industry because_____

[A] They are not suited for the production of secondary metabolites

[B] Contamination and mutation can have disastrous effect on the operation

[C] the government will not approve the licensing of pharmaceuticals produced in continuous culture

[D] All of the above

Q.2. Attempt any Seven of the following **2x7 = 14**

(a) Enlist the component parts of a fermentation process.

(b) Write a role of precursor and regulators in media with example.

(c) Enlist different components of agitation and aeration used in fermenter.

(d) Write about basic functions of fermenter.

(e) Define the terms: fed batch culture and continuous culture.

(f) Enlist different K_La determination techniques. Write significance of K_La.

(g) Define manual and automatic control with line diagram.

(h) Write about pH measurement and control.

(i) What is the role of ADC and DAC of computer linked system in fermentation industry.

Q. 3. [A] Enlist range of fermentation processes. Explain production of microbial metabolites in detail. **[06]**

[B] Discuss in detail various carbon sources used in fermentation medium and Factors influencing the choice of carbon source. **[06]**

OR

Q. 3. [B] Discuss in detail about the Placket-Burman design for medium optimization. **[06]**

Q. 4. [A] Explain in detail continuous sterilization of media with suitable flow diagram. **[06]**

[B] Give a brief account on Aseptic operation and containment. **[06]**

OR

Q. 4. [B] Give a detailed account on sterilization of air by filtration. **[06]**

Q. 5. [A] Explain product kinetics of batch culture in detail. **[06]**

[B] Write a note on scale up and scale down. **[06]**

OR

Q. 5. [B] Discuss Sulphite oxidation technique for determination of K_La. **[06]**

Q. 6. [A] Enlist different type of automatic control. Explain proportional and integral control in detail. **[06]**

[B] Discuss in detail the pressure measurement and control. **[06]**

OR

Q. 6. [B] Give a detail account on computer application in fermentation technology. **[06]**

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SIC

SEAT No._____ No. of Printed Pages: 2

{ } SARDAR PATEL UNIVERSITY

M.Sc. (Integrated) Biotechnology (IGMBT), Seventh Semester Examination

[56]

Thursday, 2 November 2017

2:00 P.M to 5:00 P.M

PS07CIGMB1: Regulation of metabolic pathways

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: **[8]**

(1) Which of the following is true?
Control of synthesis of enzymes is done by:
(a) feedback inhibition and catabolic repression
(b) enzyme induction and end product repression
(c) end product repression, enzyme induction and catabolite repression
(d) feedback inhibition, enzyme induction and end product repression

(2) Regulation of typtophan biosynthesis is a example of:
(a) catabolic repression (b) enzyme induction
(c) end product repression (d) None of the above

(3) Hormone binding trigger change in conformation so that it can interact with DNA sequence called as _____
(a) Hormone regulatory element (b) Hormone Recognize element
(c) Hormone Response Factor (d) Hormone repressor factor

(4) Which of the following factor often but not always account for extraordinary sensitivity of signal transduction?
(a) The high affinity of receptor for signal molecules (b) Cooperativity in ligand-receptor interaction (c) Amplification of the signal by enzyme cascades (d) All of the above

(5) Fructose 2, 6 biphosphate is a potent regulator of
(a) PFK-1 (b) Hexokinase
(c) Glucokinase (d) A and B both

(6) Which of the following is used as substrate for cellulose synthesis
(a) UDP Glucose (b) UTP Glucose
(c) ATP Glucose (d) ADP Glucose

(7) The conversion of UMP to dTMP is catalyzed by
(a) Thymidylate synthase (b) Ribonucleotide reductase
(c) Dihydrofolate reductase (d) ATcase

(8) Carbamoyl phosphate required in pyrimidine biosynthesis is made in the :
(a) Mitochondrial matrix (b) Cytosol (c) Mitochondrial Christial (d) Golgi apparatus

PTO

Q.2 **Answer any SEVEN from the following:** [14]

(1) Write importance of regulation of metabolic pathway in brief.
(2) Demonstrate the activity of an allosteric enzyme with a positive effectors site, in form of a diagram.
(3) What are the general features of signal transduction?
(4) Write in brief about JAK STAT pathway.
(5) Write regulation of starch synthesis in brief.
(6) Write reactions catalysed by isocitrate lyase and malate synthase.
(7) Write origin of ring atoms of purines.
(8) Differentiate between Salvage and denovo pathways.
(9) Write down the reaction of conversion of serine to glycine.

Q.3(a) Explain mechanism of gene regulation by the transcription factor SREBP-1C. [6]

(b) Write a detail note on end product repression. [6]

OR

(b) Explain the significance of covalent modification in regulation of metabolic pathway with an example? [6]

Q.4 (a) Write a note on mechanism of receptor tyrosine kinases [6]

(b) Draw eukaryotic cell cycle. Discus regulation of CDKs by phosphorylation and proteolysis. [6]

OR

(b) Describe various types of secondary messengers. [6]

Q.5 (a) Write detail account on PDH Complex. [6]

(b) Discuss glyoxylate cycle with its regulation. [6]

OR

(b) Write detail account on regulation of TCA cycle. [6]

Q.6 (a) Discuss about synthesis and regulation of purine nucleotide from PRPP. [6]

(b) Write note on regulation of ATcase. [6]

OR

(b) Explain the synthesis of amino acid from α-ketoglutarate. [6]

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SEAT No._____ (50)

No. of Printed Pages: 2

SARDAR PATEL UNIVERSITY

M. Sc. (Integrated Biotechnology) – Seventh Semester Examination (CBCS)

Monday, 6th November, 2017

2:00 p.m. to 5:00 p.m.

PS07CIGMB2: Molecular Diagnostic Techniques

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: **[08]**

i. Work flow of molecular diagnostic laboratory is _____.

(a) Unidirectional (b) Bidirectional (c) Multidirectional (d) Alldirectional

ii. Which of the following is a laboratory testing assessment for accreditation of laboratory for particular test?

(a) Imprecision testing (b) Accuracy testing (c) Proficiency testing (d) Recovery testing

iii. _____is the cleavage method which does not require PCR amplification of samples.

(a) Heteroduplex analysis (b) Invader assay (c) BESS (d) NIRCA

iv. Which of the following statement is odd/false for melt curve analysis?

(a) Exploits the sequence and stacking directed denaturation characteristics of DNA duplexes.

(b) Useful as a post-amplification step of real time PCR.

(c) Uses DNA specific fluorescence dye such as ethidium bromide and SYBR green.

(d) Initialy yield a low signal.

v. Herpes and Human papiloma viruses contains_____as genetic material.

(a) Single stranded RNA (b) Double stranded RNA

(c) Single stranded DNA (d) Double stranded DNA

vi. Hepatitis mainly destroys_____ of the body.

(a) Lungs (b) Liver (c) Intestine (d) Pancreas

vii. Which one of the following is a polygenetic disorder/syndrome?

(a) Hurler (b) Obesity (c) Gaucher (d) Cystic fibrosis

viii. Match the following and choose correct answer from the codes given below:

A. Cystic fibrosis	1. Glycogen storage disorder
B. Diabetes	2. Multiple organs
C. Phenylketonuria	3. Monogenic disorder affecting halide ion channel
D. Pompe disease	4. Inborn error of metabolism
	5. Polygenetic and lifestyle disorder

	A	B	C	D
(a)	1	2	3	4
(b)	2	4	1	3
(c)	3	5	4	1
(d)	4	3	1	2

P.T.O.

Q.2 Answer any SEVEN from the following: [14]

i. What is shadow report?

ii. Write about the types of controls used to during molecular testing to avoid false positive or negative results.

iii. Give basic principle of DOP – PCR.

iv. Explain PNA beacons in brief.

v. Write symptoms of gonorrhea.

vi. What is HPV? How it is diagnosed?

vii. What is BMI?

viii. Give an overview of Hunter's syndrome.

ix. Mention various epigenetic mechanisms.

Q.3(a) Explain operational considerations in MDL. [6]

(b) Define quality control and quality assurance. Explain selection of the test menu at MDL. [6]

OR

(b) Narrate the steps required for epidemiological study of outbreak. [6]

Q.4(a) Enlist hybridization based mutation detection technique. Describe melt curve analysis. [6]

(b) Describe dideoxy DNA fingerprinting technique for the detection of mutation. [6]

OR

(b) Write a detail note on denoting mutations using gene nomenclature method. [6]

Q.5(a) Describe the causes and symptoms of tuberculosis along with its diagnostic techniques. [6]

(b) Discuss diagnostic tests for AIDS. [6]

OR

(b) Describe diagnostic techniques for the malaria. [6]

Q.6(a) Write a detail note on diabetes mellitus. [6]

(b) Write a detail note on triple repeat disorders. [6]

OR

(b) Write short notes on the following:

1. Cystic fibrosis [3]
2. Lipidosis [3]

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SC

(124) SEAT No._____ No. of Printed Pages: 2

{ } SARDAR PATEL UNIVERSITY

M.Sc. (Integrated) Biotechnology (IGMBT), Seventh Semester Examination

Wednesday, 8 November 2017

2:00 P.M to 5:00 P.M

PS07CIGMB3: Clinical Biochemistry

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: **[8]**

(1) Arthrocentesis is a process to collect :
(a) synovial fluid (b) pleural (c) Amniotic fluid (d) none of them

(2) Arterial blood can be used for the detection of :
(a) Blood glucose (b) Blood creatinine (c) Blood urea (d) Blood gas determination

(3) Which group of Hb play important role for its buffering capacity:
(a) "Indole" group of histidine, (b) "Imidazole" group of B chain, (c) " Indol" group of proline (d) "Imidazole" group of histidine,

(4) Which of the following acids are non volatile in nature and produced by our body:
(a) Carbonic acid and Sulfuric acid (b) Sulfuric acid and phosphoric acid
(c) phosphoric acid and Carbonic acid (d) None of the above

(5) Apo-A –I is act as ligand for:
(a) VLDL receptor (b) LDL receptor (c) HDL receptor (d) all of the above

(6) Which of the following test is considering under Test based on Immunological test to detect autoimmune disease of thyroid gland?
(a) Serum PBI (b) TRH Stimulation test (c) Serum CK enzyme (d) TRCH test

(7) Decreased serum GOT level in pregnancy and cirrhosis is due to :
(a) enzyme inhibition (b) lack of cofactor (c) genetical factor (d) none of the above

(8) Myoglobin is useful biochemical marker for the (a) Liver diseases (b) heart diseases (c) bone diseases (d) all of them

PTO

Q.2 **Answer any SEVEN from the following:** [14]

(1) Discuss clinical significance of in lymph brief.
(2) Where is synovial fluid present and how is it collected?
(3) What is respiratory alkalosis?
(4) Define type 1 hyperlipoproteinemia,
(5) Role of leptin.
(6) Write brief account on Vandenberg test .
(7) Enlist types of hemoglobin based on occurrence
(8) Write a brief note on alcoholism.
(9) Discuss alpha Thalassemia in brief.

Q.3(a) Differentiate between exudates and transudates. Write composition and function of pleural fluids. [6]

(b) Write a note on collection, preservation and transportation of blood and Amniotic fluid in brief. [6]

OR

(b) Give detailed account on anticoagulants for the collection of blood specimen. [6]

Q.4 (a) Write brief account on biocarbonate mechanism for the regulation of acid base balance in the body. [6]

(b) Define proteins and classify them in detail with examples of each class. [6]

OR

(b) Give biomedical importance of Carbohydrates. [6]

Q.5 (a) What are hemoglobinopathies? Write detail note on it. [6]

(b) Write note on serum enzymes in heart diseases. [6]

OR

(b) Discuss mechanisms responsible for abnormal levels of enzymes. [6]

Q.6 (a) Write a brief account on tests used to measure blood levels of thyroid hormones. [6]

(b) Write detail account on pancreatic function test [6]

OR

(b) Write a note on test based on abnormalities of bile pigments metabolism in brief [6]

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