SEAT No._____

SARDAR PATEL UNIVERSTITY
M.Sc (INTEGRATED) BIOTECHNOLOGY- VII SEMESTER
ATKT EXAMINATION, April 2017
IG-GBT/IBT/EBT/MBT - 7th SEMESTER

[A44/A45/A46/A47]

PS07CIGGB4/PS07CIGIB4/ PS07CIGEB4/ PS07CIGMB4:
Advanced Molecular Biology

Date 8th April 2017 **TIME: 2.00 to 5.00 pm** **Maximum Marks:70**

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

(i) Mcm complex in eukaryotes has following activity
(a) Polymerase (b) ligase (c) helicase (d) exonuclease

(ii) The phosphodiester bond is formed between
(a) 3'PO_4 and 5'OH (b) 5' PO_4 and 3'OH (c) 5' PO_4 and 2'OH (d) 2' PO_4 and 5'OH

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

(iv) tRNA is synthesized by
(a) RNA polymerase I (b) RNA polymerase II (c) RNA polymerase III (d) RNA polymerase IV

(v) The process of mRNA scanning is driven by
(a) tRNA (b) rRNA (c) Small subunit of ribosome (d) large subunit of ribosome

(vi) SAM complex is a protein translocator present in the outer membrane of
(a) Mitochondria (b) Chloroplast (c) Nucleus (d) Lysosome

(vii) Transposons are _____ sequences.
(a) Complementary (b) Jumping (c) Signal (d) all of the above

(viii) Name the scientist who discovered transposons
(a) Barbara Mcintosh (b) Barbara Mclintock (c) Walter Gilbert(d) Werner Arber

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

(i) What is meant by fidelity of DNA polymerase enzyme?
(ii) What is DNA polymerase switching during replication?
(iii) Mention the characteristics of mitochondrial DNA.
(iv) Draw a schematic diagram of RAN Polymerase II core promoter.
(v) What is the role of mediator complex in transcription?
(vi) What are isoaccepting tRNAs? Give examples.

(PTO)

(vii) Write peptidyl transferase reaction.

(viii) Mention the characteristics of transposable elements?

(ix) Enlist differences between P and Ty element.

Q.3	A	Explain initiation and elongation phases of eukaryotic DNA replication.	**06**
	B	Explain cre/lox mechanism of site specific recombination.	**06**
		OR	
	B	Write a note on chloroplast DNA.	**06**
Q.4	A	Give a brief and sequential account of the transcription factors involved in eukaryotic transcription.	
	B	Explain spliceosome mediated splicing process.	**06**
		OR	
	B	Write a note on RNA editing.	**06**
Q.5	A	Explain pre-initiation complex formation during translation in eukaryotes.	**06**
	B	(i) What is the secondary structure of tRNA? Why it forms?	**3+3=**
		(ii) What are the steps in tRNA charging?	**06**
		OR	
	B	Write a note on post translational modification of proteins.	**06**
Q.6	A	Explain Ac/Ds system of maize in detail.	**06**
	B	Write short note on: (i) p53 **OR** (ii) Retinoblastoma gene.	**06**

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[A54]

SARDAR PATEL UNIVERSITY

M. Sc (Int.) Biotechnology: APR-2017 Examination

IG-EBT-7th SEMESTER

Sub: PS07CIGEB2 – Ecology and Biodiversity

Thursday, 6th April, 2017

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

Total Marks: 70

Q.1 **Fill in the blanks by choosing appropriate option.** **(08)**

(a) In the association between members of different species one is harmful to other agets benefited……..
(a) Mutualism (b) Commensalism (c) Exploitation (d) A and B both

(b) Symbiosis with similar interaction was proposed by
(a)De Bary (b)calarke (c) Odum (d) Ms, Dougall

(c) Moving out of population permanently which decrease populations density
(a)Emigration(b)Mitigation(c) immigration (d) none of them

(d) Natality rate is determined by
(a)N (b) n (c) ΔN (d) None of them

(e) UNESCO declared ……International decade of Biodiversity
(a)2010-20(b)2001-10(c)2011-21(d)2000-10

(f) The value arising from an actual use made of a given component of biodiversity
(a)Direct use value (b) Indirect value (c)Primary value (d) Skill

(g) Taxa with small population that are not endangered at present but are at risk
(a)Rare (b) Intermediate (c) Extinct (d) Endangered

(h) Seed bank is the best example of …….
(a)Ex-situ(b) In-Situ(c)Both of them(d) None of them

Q.2 **Answer the following in short.(Any SEVEN)** **(14)**

(a) Enlist Niche Types.

(b) What is character displacement?

(c) Explain in brief exponential growth curves.

(d) Define mortality.

(e) Define Hydroseres?

(f) Enlist the name of Hotspots in India

(g) Enlist value of Biodiversity

(h) Enlist example of In-situ conservation

(i) Enlist Mega-diversity countries of world.

(PTO)

Q.3	(a)	Write note on Biomes of India	(06)
	(b)	Write note on Biotic and Abiotic interaction with suitable example	(06)
		OR	
	(b)	What are plate tectonics? Explain the events of continental movements	(06)
Q.4	(a)	Write note on succession	(06)
	(b)	Write note on population size regulators	(06)
		OR	
	(b)	Explain in detail the age structure and age pyramid	(06)
Q.5	(a)	Write note on Economic importance of mammals	(06)
	(b)	Write note on goals of biodiversity conservation	(06)
		OR	
	(b)	Write causes for loss of Biodiversity	(06)
Q.6	(a)	Write note on national parks& sanctuaries	(06)
	(b)	Explain objectivities and principles of environmental education	(06)
		OR	
	(b)	Write note on Cryo-preservation of Gametes	(06)

Best of Luck

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[A57]

SARDAR PATEL UNIVERSITY
M. Sc. IGBT EXAMINATION, SEVENTH SEMESTER
PS07CIGEB3–ENVIORNMENTAL MICROBIOLOGY
7th April, 2017, 2.00 pm to 5.00 pm

Maximum Marks: 70

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

(i) In complex biofilm community, bacterial populations excrete _____ to form matrix of biofilm where bacterial populations adhere.

a. Protiens b. Polysaccharides c. Enzymes d. Lipids

(ii) Which of the chronometer is utilized for tracing microbial evolution?
a. cDNA b. RNA 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) *Rhizobium* synthesizes a Nod factor during symbiotic association with legume plant which is chemically a/an _____.

a. Protein b. Peptide c. Polysaccharide d. Oligosaccharide

(v) *Anabaena azollae* is a

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. Syntrophism c. Commensalism d. None

(vii) The algal spp shows relationship between invertebrate animals are referred as

a. Endocyano b. Zoic algae c. Endozoic algae d. Endophototrophs

(viii) A common feeding strategy found in aquatic invertebrates which ingest the microbial crust from the submerged surfaces is _____.
a. Filter Feeding b. Grazing c. Cross-feeding d. None

(PTO)

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

1. Define the role of chemolithotrophs in deep sea thermal vent habitats.
2. Define niche and how does it differ from habitat?
3. Give four examples of asymbiotic N_2 fixers.
4. Define neuston and its significance.
5. Define cometabolism. How does it serve as a basis for commensalism?
6. Define Bacteroids & explain the role of legheamoglobin.
7. Explain the role of *Bdellovibrio* as ectoparasitic microbe.
8. Explain the role of ARDRA as a tool for study of microbial community.
9. Define metagenomics and its importance.

Q.3 a. Discuss the inter-population interactions that occur in microbial community with reference to biofilm formation. 6

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

OR

b. Define diversity indices. Discuss examples of diversity indices to study structure of microbial communities. 6

Q.4 a. Define extreme thermophiles. Discuss the physiology & applications of these thermophiles. 6

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

OR

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

Q.5 a. Discuss the mechanism of nodulation process in symbiotic nitrogen fixation 6

b. Discuss the genetics of nitogenase enzyme. 6

OR

b.Discuss various factors influencing N_2 fixation process. 6

Q.6 a. Explain the difference between predation & parasitism. Discuss one example of parasitism in detail. 6

b. What is lichen? How do lichens grow on rocks & tree barks?

OR

6

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

—X—

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SARDAR PATEL UNIVERSITY

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

Thursday, 6th April, 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 facilitated diffusion **b)** through aquaporin channels only
   c) by simple diffusion **d)** by active transport

2. Engulfing solid materials by the cell is called _____.
   a) exocytosis **b)** phagocytosis
   c) pinocytosis **d)** none of above

3. Cilia and flagella of eukaryotic cells are made up of
   a) Microtubule **b)** Intermediate filament
   c) Microfilament **d)** all of above

4. Plasmadesmata occur in _____.
   a) bacterial cells **b)** plant cells
   c) animal cells **d)** all eukaryotic cells

5. A signal molecule is also known as a(n) _____.
   a) receptor **b)** initiator
   c) ligand **d)** protein

6. _____ is a common second messenger.
   a) cAMP **b)** cGTP
   c) cMHC **d)** cATP

7. The sequence of events involved in cell signaling is.....
   a) transduction → reception → response **b)** response → reception → transduction
   c) reception → response → transduction **d)** reception → transduction → response

8. How many transmembrane helices are present in GPCR?
   a) 6 **b)** 4
   c) 7 **d)** 8

(P T O)

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

1. Enlist the function of biomembranes.
2. Differentiate endocytosis and exocytosis.
3. Which type of cell junction is present in plant cells?
4. Write about microtubule related motor proteins?
5. What are check points in cell cycle?
6. Enlist the types of receptors.
7. Define signal transduction.
8. Narrate about cAMP as second messenger.
9. Write similarities between hedgehog and Wnt proteins.

Q – 3 **(a)** Write a note on electron transport chain. **(06)**

(b) Write an essay on the protein components of plasma membrane and its function. **(06)**

OR

(b) Describe the mechanisms of transport of materials across the membrane. **(06)**

Q – 4 **(a)** Give a detailed account on M-phase of cell cycle. **(06)**

(b) Describe the actin based movement in muscle contraction. **(06)**

OR

(b) Write a note on apoptosis. **(06)**

Q – 5 **(a)** Explain the structure G-protein link receptor. **(06)**

(b) Discuss the signal transduction through receptor tyrosin kinases. **(06)**

OR

(b) Explain the role of nitric oxide (NO) as a second messenger. **(06)**

Q – 6 **(a)** Write an explanatory note on Hedgehog signalling. **(06)**

(b) Explain the Notch and Delta signalling pathway. **(06)**

OR

(b) Discuss cytokine receptors activated JAK-STAT signalling pathway. **(06)**

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SEAT No._____ No. of Printed Pages: 02

[A53]

SARDAR PATEL UNIVERSITY

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

Thursday, 6th April, 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. One of the following is the most reliable enzyme based cell death assays because it does not lose its activity during cell death assays:

a) Catalase **b)** Lactate dehydrogenase
c) Glutathione peroxidase **d)** Invertase

2. To culture the hematopetic cells, which of the following media can be used?

a) MEM **b)** DMEM
c) RPMI-1640 **d)** M-199

3. Which component of serum acts as free radical scavenger?

a) Zinc **b)** Copper
c) Albumin **d)** Selenium

4. Cells floating freely in the culture medium are known as _____ culture system.

a) suspension **b)** organ
c) confluence **d)** explant

5. Deamination of glutamine release _____, Which is toxic to the cultured cells.

a) lactate **b)** Ammonium
c) Pyruvate **d)** Alanine

6. In labeled chromium uptake assay 51 Cr binds to _____.

a) membrane lipids **b)** extra cellular protein
c) intra cellular protein **d)** DNA

7. Fusion between a plasma cell and a tumor cell creates _____.

a) Myeloma **b)** Lymphoblast
c) Hybridoma **d)** Lymphoma

8. Undifferentiated cells present in a differentiated cell mass are known as _____.

a) Totipotent cells **b)** Pluripotent cells
c) Embryonic stem cells **d)** Adult stem cells

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

1. What is the significance of glucose in animal cell culture medium?
2. State two points of difference between anchorage dependent and anchorage independent cells
3. Write about air-lift fermentor culture.
4. Prepare the flow chart of basic steps to establish primary culture.
5. What is trypsinization? Write the types of trypsinization with merits and demerits.
6. Enlist the various assays to study apoptosis in cultured cell.
7. What is a multicellular tumor spheroid (MCTS) culture?
8. Enlist various applications of MABs.
9. Classify the stem cells based on potency.

Q – 3 **(a)** Explain the role of serum in animal cell culture. **(06)**

(b) Explain importance and mode of action of different chemicals used in sterilization. **(06)**

OR

(b) Explain the physicochemical properties that are a vital component for the designing of media and supplements. **(06)**

Q – 4 **(a)** What is viability? Enlist assays for cell viability and elaborate the viability assays based on membrane integrity and cellular respiration. **(06)**

(b) Write the criteria for sub-culture and explain the sub-culture method for monolayer cell culture. **(06)**

OR

(b) Explain cell lines and add a note on any three general parameters to consider in selecting a cell line? **(06)**

Q – 5 **(a)** Discuss the basic biology of *in vitro* cultured cells. **(06)**

(b) Enlist different methods used for characterization of cells during culture and describe any two methods for cell characterization. **(06)**

OR

(b) Give a detailed account on FACS technique for cell separation. **(06)**

Q – 6 **(a)** Write a short note on cryopreservation and its advantages. **(06)**

(b) How attenuated vaccines are different from inactivated vaccines? Write the method of production of attenuated vaccines. **(06)**

OR

(b) What is scaffold? Which are the different types of materials used for scaffolds preparation? Write Solvent casting and particulate leaching and gas foaming methods for scaffold preparation. **(06)**

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(A56)

Sardar Patel University
M.Sc. Integrated Biotechnology
IGIBT-PS07CIGIB3 (Fermentation Technology)
Friday, 7th April 2017
02:00 P.M. to 05:00 P.M.

Total marks: 70

Note:
1) Figures to the rights indicate marks
2) Draw neat and labeled diagram wherever necessary.

Q.I **Multiple choice questions:** **(08)**

1 Which design is best for media optimization?
(a) M C Daniet (c) Hendrix
(b) Placket burman (d) Inamne

2 In pre 1900 _____ was the main product during chronological development of the fermentation industry.
(a) Alcohol (c) Vinegar
(b) Lactic acid (d) Both a & b

3 _____ use for prevent vortex in fermenter.
(a) Sparger (c) Impeller
(b) Baffels (d) None

4 Which is a antifoaming agent?
(a) Sulphonates (c) Vitamins
(b) Protein (d) Fructose

5 _____ liquid has a constant viscosity regardless of shear.
(a) Pseudoplastic (c) Newtonian
(b) Dilatent (d) Casson body

6 Driving force can be denoted by_____.
(a) dn/dt=kn (c) KLa
(b) Qo_2 (d) $(C^* - C_L)$

7 Nested Diaphragm used as a _____.
(a) Foam sensor (c) Temperature Sensor
(b) Pressure Sensor (d) Oxygen Senser

8 DDC is the_____.
(a) Direct Detector Control (c) Direct Digital Control
(b) Direct Decimal Control (d) none of these

C1)

(PTO)

Q.II		**Answer the following (Any seven)**	**(14)**
	1.	Which properties should have an ideal antifoaming agent?	
	2.	Enlist different sources of media formulation.	
	3.	Write the different parts of fermenter with their role in fermentation process	
	4.	Define precursors. How precursors regulate the production of the product.	
	5.	Write about Bingham plastic rheology.	
	6.	Give any four applications of fed batch culture.	
	7.	Draw a labeled diagram of a fermenter.	
	8.	Draw the simple manual - control loop for temperature control.	
	9.	Enlist different temperature measurement thermometer. Write about any one.	
Q.III	**(a)**	Discuss the role of precursors and inhibitors in fermentation media.	**(06)**
	(b)	Write a note on Media optimization by conventional method.	**(06)**
		OR	
	(b)	Draw a generalized schematic representation of a typical fermentation process. Write the six basic components of a fermentation process.	**(06)**
Q.IV	**(a)**	Give a note on design of continuous sterilization process.	**(06)**
	(b)	Write a note on sterilization of air by filtration.	**(06)**
		OR	
	(b)	Write in detail about the components used in aeration and agitation in fermentation process.	**(06)**
Q.V	**(a)**	Discuss kinetics of substrate utilization in batch and continuous culture.	**(06)**
	(b)	Write a note on static method of gassing out technique used for KLa determination.	**(06)**
		OR	
	(b)	Explain factors affecting KLa in brief.	**(06)**
Q.VI	**(a)**	How can you measure the foam formation? Write about its control also.	**(06)**
	(b)	Write the three distinct area of computer function in fermentation technology with layout of controlled fermenter with only one control loop.	**(06)**
		OR	
	(b)	Discuss about pH measurement and control.	**(06)**

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{ } SARDAR PATEL UNIVERSITY

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

[A58]

Friday, 7th April 2017

2:00 A.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) **Which of the following are examples of transcellular fluids?**
(a) Plasma water, synovial fluid, CSF (b) Bone water, plasma water, CSF
(c) CSF, synovial fluids, peritoneal fluid (d) None of the above

(2) **Body water exists in forms of:**
(a) Tissue fluid and cellular fluid (b) Blood and plasma
(c) Intracellular and extracellular fluid (d) all the above

(3) **Which of the following acid is produced during oxidation of S-containing amino acids?**
(a) Carbonic acid (b) Sulfuric acid (c) Iatrogenic (d) Phosphoric acid

(4) **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.

(5) **MGEX test is comes under:**
(a) Pancreatic functions test (b) Thyroid test (c) Liver function test (d) None of them

(6) **Vander bergh test is used to detect:**
(a) Fatty liver (b) Jaundice (c) Both a and b (d) None of the above

(7) **Which hormone is responsible for obesity:**
(a) Insulin (b) leptin (c) epinephrine (d) T3

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

Q.2 Answer any <u>SEVEN</u> from the following: [14]

(1) How mixture of Ammonium oxalates and potassium oxalates maintains integrality of cells when used as a anticoagulant?
(2) Write principle actions of thyroid hormone.
(3) Where is CSF fluid present and how is it collected?
(4) What is metabolic acidosis?
(5) Define type 1 hyperlipoproteinemia.
(6) Write principle actions of thyroid hormone
(7) Enlist types of hemoglobin based on occurrence
(8) Write brief account on alcoholism.
(9) Differentiate between hemolytic and obstructive jaundice.

PTO

Q.3 (a) Discuss collection transportation, preservation and importance of synovial fluid. [6]

(b) Write functions of lymph. [6]

OR

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

Q.4 (a) How hemoglobin act as a buffering Agent in blood explain in detail. [6]

(b) Write detail note on metabolic alkalosis. [6]

OR

(b) Classify and explain hyperlipoproteinemias [6]

Q.5 (a) Enlist cardiac function tests. Discuss group I tests in detail. [6]

(b) Enlist the functions of proteins [6]

OR

(b) Write brief account on hemoglobinopathies.. [6]

Q.6 (a) Explain tests based on excretory functions of liver in detail [6]

(b) Write detail account on obesity. [6]

OR

(b) Write brief account on Serum PBI and BEI test [6]

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