15.09.18 (1st Half)

QP BTC 01/ B.Tech/OddSem/18-19

2018-19

411

Life Science

BTC 01

Mid Semester Examination

Time – Two hours Full Marks – 30

Figures in the margin indicate full marks

Answer all questions

1. What is a signaling cell? What do you mean by signaling molecule? What is the difference between autocrine and paracrine signaling? How two distantly located cells communicate with each other? 1+1+2+1

2. a. What is cell and what are the basic characteristics of the cell?
   b. What are the basic differences between animal and plant cell?
   c. The plant, fungi and bacteria has extra structure surrounding its plasma membrane called cell wall. Match the following organism with their cell wall properties:

1. Plant	a. Chitin
2. Bacteria	b. Cellulose
3. Fungi	c. Peptidoglycan

2+2+1

3. Name the bases that are present in RNA. What is the function of SiRNA? 2+3

4. Why is glucose not stored in its monomeric form? 5

5. What is the difference between Autotrophic and Heterotrophic microorganism? Explain the role of Water in the preparation of Nutritional media for microorganisms. 2+3

6. Briefly write on methanogenic and methanotrophic microorganisms. 5

11.09, 2018 (1st Half)

Questions Mid term: Cell Biology and Genetics: BTC 301/Odd Semester 2018-19

Time: 2 hrs **Full Marks- 30**

Group A:

Answer any three questions:

1. What are the possible causes of polyploidy? 5

2. How does environment (with context to temperature) affect the gene function? 5

3. Does a gene alone determine a particular character? 5

4. What is Turner's syndrome? 5

Group B:

Answer any three questions:

1. What are the basic differences between a prokaryotic cell and a eukaryotic cell? What are the differences between a bacterial cell, a plant cell and a mammalian cell? 2+3=5

2. Write down the chemical composition of a typical mammalian cell. Write down one important function of mitochondria. Name a marker protein for mitochondria. 2+2+1=5

3. What are the major functions of a biological membrane? What is the difference between active transport and passive transport? What type of transporter protein is a sodium-potassium pump? 2+2+1=5

4. Give examples of one molecular marker for cytosol and nucleus. How will you check the purity of nuclear fraction and cytosolic fraction? 2+3=5

12/09/18
(1st Half)

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B. Tech.(Odd Sem)/2018 -19/Mid Sem

2018 - 2019

MICROBIOLOGY & BIOPROCESS TECHNOLOGY
BTC 302

Full Marks: 30 **Time: Two Hours**

Figures in the margin indicate full marks
Write answers in proper sequences of questions

SECTION – A (Microbiology)

A. Answer any three (03) of the following: **3 X 5 = 15**

1. How does fluid-mosaic model describe bacterial cell membrane structure? 5

2. Briefly write on cell wall of gram-negative bacteria. 5

3. Briefly write on F-plasmid and R-plasmid of bacteria. 5

4. Define active transport using ABC transporter. What is group translocation? 5

SECTION - B (Bioprocess Technology)

B. Answer any three (03) of the following: **3 X 5 = 15**

1.Describes the factors associated with Ph change of the media and how to neutralize the changed Ph? 5

2.Define yield co-efficient. Describe the dependence of volumetric flow rate and cell concentration. 5

3.Compare batch, fed-batch and continuous bioreactor 5

4.Comment on the sterilization of crude media. 5

13/09/18
(1st Half)

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B.Tech/MidSem -Odd/2018~~19~~

Biochemistry and Enzyme Technology

BTC-331

Full Marks: 30

Time: 2 hours

The figures in the margin indicate full marks

Answer all Questions. Graph papers to be provided

1. Name the following:
   a) The overall balanced chemical equation for TCA cycle. (1)
   b) The only membrane bound enzymes present in the citric acid cycle. (1)
   c) Enzymes unique to the glyoxylate cycle. (1)
   d) Define Isoelectric Point (1)
2. Under normal conditions , the rates of glycolysis and of citric acid cycle are integrated. Explain (5)
3. Why is it important that gluconeogenesis is not the reversal of glycolysis? (2)
4. Describe the PDH complex and the reaction mechanism (5)
5. Synthesis of the activated form of acetate is carried out in an ATP dependant process:

   The Δ'° for hydrolysis of acetyl CoA is -32.2 KJ/mol and that of hydrolysis of ATP to AMP and PPi is -30.5 KJ/mol. Calculate the Δ'° for the ATP dependant synthesis of acetyl CoA.? (3)

6. The following experimental data were collected during a study of the catalytic activity of an intestinal peptidase with the substrate glycylglycine.

S (mM)	Product formed (μg/ml)
1.5	0.21
2	0.24
3	0.28
4	0.33
8	0.40
16	0.45

Use graphical analysis to determine the K_m and V_{max} for this enzyme preparation. (3+3)

7. What are the effects of Reversible Inhibitors on apparent K_m and Apparent V_{max}? (3)
8. Which biochemical signals activate glycogenolysis in muscle? (2)