B.Pharm Even Semester Examination, May, 2025

PHARMACEUTICAL SCIENCES

(8th Semester)

Course No: BP-808ET

(Cell and Molecular Biology)

FM: 75

Time: 3 Hours

The figures in the right margin indicate full marks for the question

I A. Objective type (Choose the correct answer of the following) 1x10=10

1. Which of the following are effector proteins of G proteins

   a) Ion channel

   b) Nitric oxide synthase

   c) Phospholipase A

   d) All of the above

2. T-lymphocytes activation in response to antigenic stimulation, is

   a) Endocrine signalling

   b) Paracrine signalling

   c) Autocrine signalling

   (d) Juxtracrine signalling

3. Nature of signalling is involved in Paracrine signalling?

   (a) Chemical signalling

   (b) Synaptic transmission

   (c) Hormonal Communication

   (d) Auto stimulation of cell

4. Cell signalling is

   (a) Intercellular

   (b) Intracellular

   (c) Both (a) and (b)

   (d) None of the above

5. In prokaryotic gene regulation, the repressor protein binds to the:

   a) Promoter

   b) Operator

   c) Enhancer

   d) Terminator

6. Which enzyme is responsible for supercoiling bacterial DNA?

   a) Helicase

   b) DNA polymerase

   c) Topoisomerase

   d) Ligase

III. Short answers (Answer seven out of nine questions) 5x7=35

1. Explain"autocrine and endocrinecell signalling pathways" with a diagram. 2.5x2=5

2. Explain Cell surface receptor and Termination Codon. 3+2=5

3. What is GENETIC CODE? write initiation codon? what is anti-codon? 2+1+2=5

4. Explain the function of protein kinase

5. What are the different enzymes involved in the central dogma of life? 5

6. HowOkazaki fragmentsare formed?Explain with diagram 3+2=5

7. What is the difference between Prokaryotic and Eukaryotic? Explain with diagram. (2.5+2.5)

8. What are the Methods for Creating Transgenic Animals and what are the applications? (3+2)

9. Enlist the modern techniques of cell and molecular biology and explain any two techniques. (1+2+2)

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7. Which process ensures genetic diversity in bacteria by the exchange of genetic material between two cells?

   a) Transformation

   b) Conjugation

   c) Transduction

   d) Replication

8. Which of the following base-pairing rule is correct?

   a. Adenine with guanine and thymine with cytosine

   b. DNA base pairing is non-specific

   c. Adenine with cytosine and guanine with thymine

   d. Adenine with thymine and guanine with cytosine

9. In the plasma membrane, carbohydrates

   a. always faces outwards, towards extracellular space

   b. directed to all sides in the membrane randomly

   c. always faces to the lumen of cells

   d. always faces inward to the nonpolar portion of the membrane

10. This condition is necessary for a cell to qualify through the G2 checkpoint

    a. Cell should be of a size sufficient enough

   b. Complete and accurate DNA replication

   c. Sufficient nucleotides

   d. Complete attachment of mitotic spindle fibers to kinetochores

I B. Answer the following questions 2x5=10

1. What is Si-RNA"?

2. What is riboswitch?

3. Explain Chargaff's rule?

4. Draw a cell cycle diagram showing various checkpoints.

5. What is mitosis and meiosis?

II. Long answers (Answer two out of three questions) 10x2=20

1. What are the different steps involved in Protein synthesis?Define gene expression. What is intron & exon? What is Chargaff's rule. Explain the term helicase and TATA box.
   1.5+2+1.5+2+1.5x2=10

2. Enumerate the different types of cell surface receptors. What is a G-protein coupled receptor? Categorise different types of signalling. What do you mean by intracellular receptors in cell Signalling and highlight its function? 3+2+2+3=10

3. What are cell cycle checkpoints? How can we analyze the cell cycle by using Flow cytometry? Explain. (4+6)