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

1. Explain "autocrine and paracrine cell signalling pathways" with a diagram. 2.5 x 2=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. Differentiate between DNA and RNA. 5
5. What are the different enzymes involved in the central dogma of life? 5
6. How Okazaki fragments are formed? Explain with diagram. 3+2=5
7. What is the difference between Prokaryotic and Eukaryotic? Explain with a diagram. (2.5+2.5=5)
8. What are the properties of cell membranes? Discuss about the fluid mosaic model. (2+3=5)
9. What are the modern techniques of cell and molecular biology? 5

★★★

UG (CBCS) EVEN SEMESTER EXAM, JULY 2024

PHARMACEUTICAL SCIENCES

(8th Semester)

Course No: BP - 808 ET

(CELL AND MOLECULAR BIOLOGY - Theory)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

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

1) Which of the following accurately describes the genetic code?
   a) The genetic code is a set of instructions for protein folding
   b) The genetic code is a sequence of amino acids that make up a protein.
   c) The genetic code is a set of rules determining the correspondence between nucleotide triplets (codons) and amino acids.
   d) The genetic code is a DNA replication process.
2) How many possible codons are there in the genetic code?
   a) 20 b) 61
   c) 64 d) 42

3) In the plasma membrane, lipid molecules are arranged in
   - a) head parallel
   - b) alternate
   - c) scattered
   - d) series

4) Riboswitch is the regulatory segment of ....
   - a) m-RNA
   - b) t-RNA
   - c) rRNA
   - d) none of the above

5) Hormone functioning through ______ signalling
   - a) Paracrine
   - b) Autocrine
   - c) Endocrine
   - d) Intracellular

6. This condition is necessary for a cell to qualify through the G2 checkpoint
   - a) The 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

7. Which of the following base-pairing rules 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

8. In the plasma membrane, carbohydrates
   - a) Always faces outwards, towards extracellular space
   - b) Directed to all sides of the membrane randomly
   - c) Always faces to the lumen of cells
   - d) Always faces inward to the nonpolar portion of the membrane

9. Which of the following is the basic category of chemical signaling found in multicellular organisms?
   - a) Paracrine signaling
   - b) Autocrine signaling
   - c) Endocrine signaling
   - d) All of the above

10. Nuclear DNA replicates in the ________ phase.
    - a) G2 phase
    - b) M phase
    - c) S phase
    - d) None

I. B. Answer the following questions 2x5=10

1. What is "helicase"?
2. What is riboswitch?
3. What is 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? Explain with a neat diagram of translation emphasizing those steps. 10
2. Define the terms as mentioned
   a) Promoter b) Operon c) siRNA
   d) aptamer e) TATA box 2x5=10
3. What are cell cycle checkpoints? How can we analyze the cell cycle? Explain. (4+6=10)