

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)CLASS: Pharmacy
BRANCH: PHARMACYSEMESTER: VIII
SESSION: SP2022

SUBJECT: Cell and Molecular Biology (BP808ET)

TIME: 3.00 Hours

FULL MARK: 75

INSTRUCTIONS:

1. The missing data, if any, may be assumed suitably.
2. Before attempting the question paper, be sure that you have got the correct question paper.
3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
4. This question paper consists of (03) three parts. Read the part wise instructions before attempting the questions.

PART-I

Objective types questions (Instruction: Answer all questions)

Q1. Short answer Questions:

(5 x 2 = 10 Marks)

1. What do you mean by Extremophiles & Thermophiles?
2. Define pH.
3. What do you mean by chromosomal and extrachromosomal material of bacteria?
4. What are the three important components of cell theory?
5. What do you mean by locomotor organelle of bacteria?

Q2. Multiple Choice Questions:

(10 x 1 = 10 Marks)

- I. A polypeptide with a net positive charge at physiologic pH (~7.4) most likely contains amino acids with R groups of what type?
 - a) Acidic R group
 - b) Aliphatic R group
 - c) Aromatic R group
 - d) Basic R group
- II. At low pH amino acids exists in _____ form
 - a) Cationic
 - b) Anionic
 - c) Zwitterion
 - d) None of the above
- III. Proteins carries net _____ charge at its isoelectric point
 - a) Negative
 - b) Positive
 - c) Neutral
 - d) Zero
- IV. Naturally occurring proteins are usually polymers of
 - a) D-amino acids
 - b) L-amino acids
 - c) a mixture of D and L amino acids
 - d) Either D or L amino acids
- V. During which stage of mitosis does cytokinesis usually occur in animals?
 - a) Anaphase
 - b) Telophase
 - c) Prophase
 - d) Metaphase
 - e) Interphase
- VI. Passage of a cell through stages of cell cycle is controlled by a protein kinase that phosphorylates many different proteins at appropriate times
 - a) Cyclin-dependent kinase
 - b) Cdk activating kinase
 - c) Cyclins
 - d) Tyrosine kinase

- VII. Individual chromosomes become distinct through a light microscope during this mitotic stage
- Anaphase
 - Prophase
 - Metaphase
 - Prometaphase
- VIII. During which stage of meiosis do the sister chromatids begin to move toward the poles?
- Anaphase II
 - Telophase I
 - Prophase I
 - Telophase II
 - Anaphase I
- IX. Which of the following statements about lac operon in *E. coli* is true?
- Promoter is the binding site for the lac repressor
 - Operon is only switched on in the absence of lactose in the growth medium
 - β -galactosidase is only produced in large quantities when the lac repressor is bound to the operator
 - Lac operon mRNA is a polycistronic mRNA
- X. _____ brings in proteolysis of cyclin by recruiting proteases
- Ubiquitins
 - CDK
 - Tyrosine kinase

PART-II

Short Answers

(Instruction: Answer seven out of nine questions)

(7 x 5 = 35 Marks)

- Discuss the similarity and differences between prokaryotic and eukaryotic cells?
- Describe how proteins play an important role in maintaining all kinds of activities of human system?
- Write in details about three types of RNA.
- Discuss the properties of genetic code in detail.
- Illustrate the ionization characteristics of amino acids.
- What is signal transduction? Illustrate the role of different receptors in cell signaling process.
- Discuss the role of different bonds in primary structures of proteins.
- Illustrate the steps in Meiosis II
- How Cdk activity is suppressed by inhibitory proteins?

PART-III

Long Answers

(Instruction: Answer two out of three questions)

(2 x 10 = 20 marks)

- What do you mean by translation? Discuss the steps of translation in detail.
- What is RNA Polymerase? Discuss steps of transcription in detail.
- Elaborate the function of Cdks in cell cycle control system.

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