

No. of Printed Pages : 3

MBC-002

M. SC. (BIOCHEMISTRY) (MSCBCH)

Term-End Examination

December, 2024

MBC-002 : CELL AND MOLECULAR BIOLOGY

Time : 3 Hours

Maximum Marks : 100

Note : Answer any *five* questions. All questions carry equal marks.

1. (a) Explain the following in 1-2 sentences each : 5×2=10

- (i) Nucleosome
- (ii) Peroxisome
- (iii) Proteoglycan
- (iv) Endocytosis
- (v) Intron

(b) Discuss the structural organisation and function of nucleus with suitable diagram.

10

2. Write notes on the following : 4×5=20

(a) Dynamic behaviour of microtubules

C-2724/MBC-002

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- (b) Semi-conservative model of DNA replication
 - (c) Poly-U experiment
 - (d) Cot curve
3. Describe the following processes with the help of suitable diagrams : 10+10
- (a) Bacterial transcription
 - (b) Prokaryotic DNA replication
4. Differentiate between the following pairs : 4×5=20
- (a) Prokaryotic and Eukaryotic translation
 - (b) Mismatch repair and Nucleotide excision repair
 - (c) Active transport and Passive transport
 - (d) Apoptosis and Necrosis
5. (a) Draw a well-labelled diagram of each of the following : 2×5=10
- (i) Metaphase chromosome
 - (ii) Gap junction
 - (iii) Mitochondria
 - (iv) Plasma membrane
 - (v) Cell cycle checkpoints

[3]

- (b) Give a detailed overview of signalling molecules. 10
6. (a) What are DNA binding motifs ? Discuss any *one* of them with suitable diagram. 2+8

Or

- Describe post-transcriptional processing of RNA. 10
- (b) State Wobble hypothesis and its significance. 10
7. (a) Describe the steps involved in the initiation of bacterial translation process with suitable diagrams. 10
- (b) Elaborate the structural organisation of Lactose (Lac) Operon. 10
8. Write notes on the following : 4×5=20
- (a) RNA Editing in Eukaryotes
 - (b) Translational Control in Eukaryotes
 - (c) Eukaryotic RNA polymerases
 - (d) Mutagenesis

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