

U.G. 1st Semester Examination - 2021
Molecular Biology & Biotechnology
[HONOURS]
Course Code : MBBT-H-102-T-CCR-2
(Cell Biology)

Full Marks : 40 Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **five** questions: $2 \times 5 = 10$
- a) What is 'refractory period' and 'saltatory conduction'?
 - b) Why an action potential cannot travel in a backward direction?
 - c) Name two diseases each associated with mutation in integrin subunit and collagen fibres.
 - d) What is the role of cytoskeleton in cellular transport?
 - e) Why 16S rRNA is used to study evolutionary relationship between different taxa?

[Turn Over]

- f) Justify the name 'Intermediate Filament'.
 - g) What are the subunits of prokaryotic, eukaryotic and mitochondrial ribosome?
 - h) Mention the site of 'Light Reaction' and 'Calvin Cycle' in the chloroplast.
2. Answer any **two** of the following: $5 \times 2 = 10$
- a) What are the significances of ER and Golgi Apparatus in post translational modification and packaging of proteins?
 - b) Describe the biogenesis of Lysosomes. What is the role of Lysosome in apoptosis?
 $2\frac{1}{2} + 2\frac{1}{2}$
 - c) Schematically explain how sodium potassium ATPase pump produces an electrochemical gradient across the cell membrane.
 - d) Explain the mechanism behind membrane depolarization and repolarization.
3. Answer any **two** of the following: $10 \times 2 = 20$
- a) Give a comparative account of nuclear, mitochondrial and chloroplast genome. Write the role of euchromatins and heterchromatins in gene expression? What are the functions of nucleoporins?
 $5 + 3 + 2$

- b) Mention one suggested pathway for the evolution of eukaryotic cell and its internal membranes. What is the role of porin? Explain the effect of disruption of mitochondrial inner membrane potential in cellular energy production? 4+2+4
- c) Schematically explain the role of integrin molecules in circulating blood cells and non circulating epithelial cells in inflammatory response and cell adhesion, respectively. Write the significance of desmosomes and hemidesmosomes in cell. How collagen fibres are formed? 5+2+3
- d) Differentiate between protooncogene and viral oncogene. What cytological changes you will observe in a cancerous biopsy tissue sample under a microscope? With diagram explain the process of metastasis. 'Some organs are more susceptible to metastasis and secondary tumor formation than others'. Explain. 1+3+4+2
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