'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours Part-II Examination, 2022

BOTANY

PAPER-V

CELL BIOLOGY AND PLANT BIOCHEMISTRY

Time Allotted: 4 Hours | Full Marks: 70

The figures in the margin indicate full marks.

1. Answer the following questions: 2×7 = 14
   (a) What are viroids? Give an example.
   (b) Define crossing over. Write the significance of crossing over.
   (c) State two functions of histone proteins.
   (d) Mention characteristic features of mitochondrial genome.
   (e) Define free energy.
   (f) What is pH? Why is it important for living organisms?
   (g) What are stereoisomers? Give an example.

2. Answer any ***two*** questions of the following: 16×2 = 32
   (a) Discuss about the structure of chromosome with reference to nucleosome model. Mention the characteristic features of metaphase chromosome. 10+6
   (b) Describe the ultrastructure of prokaryotic ribosome with proper labelled diagram. Compare between prokaryotic and eukaryotic ribosomes. Discuss in detail, the functions of ribosomes. (6+4)+3+3
   (c) Write down the principles of electron microscopy. Briefly describe the process and preparation of samples for electron microscopic study. Write a brief note how does the electron microscopy promoted biological research and study. 4+6+6
   (d) Write a short note on prokaryotic DNA replication. What do you mean by proofreading activity? Describe the role of telomerase in eukaryotic DNA replication. 10+3+3

3. Answer any ***three*** questions of the following: 8×3 = 24
   (a) Compare prokaryotic and eukaryotic cells. Mention the characteristics features of domain archaea. 5+3
   (b) Describe the structure and functions of nuclear envelope. Mention the role of H-bond in living world. 5+3
   (c) Write short notes on the following: 4×2 = 8
   (i) Secondary structures of protein
   (ii) Allosteric enzyme
   (d) Tabulate the classification of lipids with suitable examples. Name one saturated fatty acid and one unsaturated fatty acid. 6+2
   (e) Describe the role of various factors affecting enzyme activity. State the significance of K_m. 4+4

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