

This question paper contains 3 printed pages]

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S. No. of Question Paper : 5820

Unique Paper Code : 3182011102

Name of the Paper : Cell Biology

Name of the Course : B.Sc. (H) Biomedical Science (NEP-UGCF)

Type of Paper : DSC

Semester : I

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all.

Give illustrations and examples wherever required.

Question No. 1 is compulsory.

1. (a) Define the following (any three) :

2×3=6

(i) Prokaryotic cell

(ii) Membrane lipids

(iii) Nucleolus

(iv) RER

(b) Differentiate between the following (any two) :

3×2=6

(i) Mitochondria and chloroplast

(ii) Extracellular and intracellular receptor,

(iii) Cilia and Flagella

P.T.O.

(c) State whether the following statements are true or false and give justification (any *three*) : 2×3=6

- (i) Peroxisome does not participate in H_2O_2 metabolism.
- (ii) Transport of molecules occurs through nuclear pore complex by active and passive diffusion both.
- (iii) cAMP is a primary messenger.
- (iv) Actin is an example of microfilaments.

2. (a) What are detergents ? Discuss their use in studying membrane proteins. 8
- (b) Discuss in detail the mechanism by which glucose is transported across intestinal epithelial cells. 10
3. (a) How do cells communicate with one another differently in case of plants and animals with the help of junctions ? Elaborate. 8
- (b) Explain with the help of a diagram the process of co-translation targeting of secretory proteins to the ER. 5
- (c) Highlight the role of NLS and NES in the transport of proteins in and out of the nucleus. 5
4. (a) What is the importance of lysosomes in the cellular machinery ? Detail the cause and symptoms of any *two* lysosomal storage disorders. 9
- (b) How do desmosomes and hemidesmosomes differ in their structure and role of anchoring in an animal cell ? 9

5. (a) . With the help of a well-labelled diagram, describe the structure of an axoneme. Add a note on the functions of its different components. 8
- (b) Which of the cytoskeletal elements have identical ends and lack polarity? Describe their structure and assembly with the help of suitable illustrations. Also mention the different monomers of these cytoskeletal elements. 10
6. (a) Describe the different stages of two phases of meiosis with diagrams. Explain how they differ from each other. 10
- (b) What are GPCRs ? Explain their role and mechanism of action in cell signaling. 8