REV-01
BBT/01/05

2023/01

SET A

B.Sc. BIOTECHNOLOGY
FIRST SEMESTER (REPEAT)
CELL BIOLOGY
BBT-102
[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

(Objective)

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: *1×20=20*

1. Lipids that are found in biological membranes:
   a. Are amphipathic
   b. Are commonly referred to as triacylglycerols
   c. Contain only unsaturated fatty acyl chains
   d. Are normally covalently associated with proteins

2. In the fluid mosaic model of the membrane:
   a. The protein is arranged in layers
   b. The lipid has no specific arrangement
   c. The lipid is fluid and arranged in a bilayer with functional protein embedded in them
   d. Lipids and proteins are not arranged in any particular order

3. Movement of substances across cell membrane is controlled by the:
   a. Size of the permeating particles
   b. Permeability of membrane
   c. Membrane protein
   d. All of the above

4. A membrane transport protein is said to be a carrier protein if:
   a. It forms an open pore through which a molecule can diffuse
   b. An electrochemical gradient is necessary for transport to occur
   c. It allows transport down a concentration gradient
   d. It binds to the molecule and changes shape during transport

5. Membranes of the following two organelles are continuous:
   a. ER and Golgi apparatus
   b. Nucleus and ER
   c. Golgi apparatus and Plasma membrane
   d. Golgi apparatus and Lysosome

6. Which of the following statements is true for smooth endoplasmic reticulum?
   a. It is made up of a single lipid layer membrane
   b. It is involved in protein biosynthesis
   c. It is involved in lipid biosynthesis
   d. It is a site for interleukin-2 biosynthesis

7. Golgi complex plays a major role in:
   a. Protein synthesis
   b. Glycosylation of lipids and proteins
   c. Removal of sulfate from the carbohydrate moiety of glycolipids
   d. Formation of secondary lysosomes

8. A distinctive feature of the lysosome is that it has:
   a. A lower pH than the cytoplasm
   b. A reduced hydrolase activity
   c. DNA
   d. Ribosome

9. Actin filaments and microtubules share all of the following properties except:
   a. They are involved in cell motility
   b. They are intrinsically polar structures
   c. They can associate with motor proteins
   d. They are assembled from subunits that are heterodimers

10. Colchicines treated cells are arrested in:
   a. S- phase
   b. Prophase
   c. G1- phase
   d. Metaphase

11. The nucleosome:
   a. Contains DNA and non-histone proteins
   b. Has a core of histones with DNA bound around it
   c. Is fully responsible for DNA packaging into chromosomes
   d. Surrounds nuclear pores

12. NOR (nuclear organizing pores) occurs in the region of:
   a. Secondary constriction
   b. Primary constriction
   c. Telomere
   d. Centrosome

13. The major events of mitosis prophase include all of the following except:
   a. Chromosome coiling
   b. DNA replication
   c. Nuclear envelope breakdown
   d. Nuclear disaggregation

14. In the cell cycle, mitosis occurs between:
   a. G1 phase and S phase
   b. S phase and G1 phase
   c. S phase and G2 phase
   d. G1 and G2 phase

15. p53 protein is associated with all of the following except:
   a. Tumor suppression
   b. Programmed cell death
   c. Transcription
   d. Post transcription modifications

16. Telomeres are present in eukaryotic genome at the chromosomal ends:
   a. As selfish DNA
   b. To protect them from breakdown
   c. To encode essential genes involved in ageing
   d. To silence genes at the ends of chromosomes

17. Entry into M phase is not allowed if:
   a. The cell is not big enough
   b. Sufficient nutrients are not available
   c. DNA replication is not complete
   d. Mitotic cyclin is over expressed

18. The three DNA sequences which define a chromosome include all of the following except:
   a. Centromere
   b. Enhancer
   c. Origin of DNA replication
   d. Telomere

19. Actin filaments are involved in all of the following except:
   a. Amoeboid movement
   b. Cytoplasmic streaming
   c. Contraction of smooth muscles
   d. Flagellar movement in bacteria

20. Which of the following enzymes do not occur in the lysosomes?
   a. Phosphatase
   b. Lipase
   c. Proteases
   d. Polymerase

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(Descriptive)

Time : 2 hr. 30 mins. Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. a) What is the Cell theory and what are its exceptions? 5
   b) What are lysosomes? Describe their types and functions. 5
2. What is the Golgi apparatus? Describe its structure and the various functions of Golgi apparatus in the cells. 10
3. a) What is the 'Fluid Mosaic Model'? 5
   b) Write a note on the various functions of plasma membrane. 5
4. a) What are chromatin and describe its structure? 5
   b) Write a note on the types of chromosomes based on the position of centromere. 5
5. a) What is the cell cycle? 5
   b) Describe the various stages of Mitosis. 5
6. a) What are intermediate filaments and what are its functions? 5
   b) Compare microtubules, microfilaments and intermediate filaments. 5
7. Differentiate between: 5+5=10
   a) Euchromatin and Heterochromatin
   b) Prokaryotic cell and Eukaryotic cell
8. Write short notes on: 5+5=10
   a) The Na+/K+ Pump
   b) Cancer

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