

(6 pages)

S.No. 2560

P 22 BCCC 1 A

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Bio – Chemistry – Core Choice Course

CELL BIOLOGY

Time : Three hours

Maximum : 75 marks

SECTION A — (20 marks)

Answer ALL questions.

I. Multiple choice questions (5 × 1 = 5)

1. In membrane, lipids are
 - (a) Glycerophospholipids
 - (b) Spinogolipids
 - (c) Sterols
 - (d) All of these
2. The smooth endoplasmic reticulum is the site of
 - (a) phospholipid
 - (b) amino acid synthesis
 - (c) carbohydrate synthesis
 - (d) protein synthesis

3. Fatty acids can be transported into and out of cell membrane by
 - (a) Active transport
 - (b) Facilitated transport
 - (c) Diffusion
 - (d) Osmosis
4. Which of the following is used by cells to interact with other cells?
 - (a) Cell tubules
 - (b) Cell junctions
 - (c) Cell adhesions
 - (d) Cell detectors
5. Which of the following stem cells have the ability to differentiate into all cell types in the body.
 - (a) Pluripotent cells
 - (b) Multipotent cells
 - (c) Omnipotent cells
 - (d) None of the above
- II. Fill in the blanks (5 × 1 = 5)
6. The membrane which allows only water but no solute particle to pass through them is known as _____

7. _____ are central, flattened, saucer-like closed compartments which are held in parallel bundles.
8. The protein present in the protofilament of microtubule is _____
9. The cells in which meiosis takes place are known as _____
10. Embryonic stem cells are derived from the inner mass of the _____

III. Answer the following questions. (5 × 2 = 10)

11. What is a cell? Define cell theory?
12. What is pore complex?
13. What is the role of cadherin in cell-cell adhesion?
14. What is chiasma terminalization?
15. What are the types of stem cells?

SECTION B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b)

16. (a) What are archaea? What are their characteristics? How do they differ from bacteria and eukarya?

Or

- (b) What is communicating junction? Describe the structure and function of gap junction?

17. (a) Briefly describe the molecular organization of thylakoid and its membrane.

Or

- (b) Describe the mechanism of electron transport system in mitochondria.

18. (a) Describe the chemical organization of fibronectin.

Or

- (b) Describe the phenomena of cell adhesion and intercellular communications.

19. (a) What are CDKs and cyclins? Describe different types of CDKs and cyclins.

Or

- (b) How does G1-cell cycle check point control related to cancer induction?

20. (a) Describe the sources, properties of the stem cells.

Or

- (b) Classify the stem cells. Discuss.

SECTION C — ($3 \times 10 = 30$)

Answer any THREE questions

21. Structural complexity of eukaryotes is reflected in their subcellular structures. Discuss
22. Describe the nuclear envelope and the structure of its pores. What similarities occur between nuclear envelope and endoplasmic reticulum.
23. Describe the structure of collagen? What is its role in cell matrix adhesion? Classify different types of collagen.

24. What is mitotic check point? How these checkpoints are regulated by molecular mechanisms?

25. Discuss about the stem cell morphology differentiation.
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