

- N.B. : (1) All questions are compulsory.
 (2) All questions carry equal marks.
 (3) Draw neat, labelled diagrams wherever necessary.

1. (a) Give one example of any three of the following :- 3
 (i) Cytoskeletal proteins.
 (ii) Cell signaling.
 (iii) Microtubule monomers.
 (iv) Microfilament function.
 (v) Cross linking protein.
 (vi) Second messenger.
- (b) Give an account of any two of the following :- 12
 (i) Types of intermediate filaments.
 (ii) Structure and function of cytoplasmic dynein.
 (iii) Drugs affecting formation of microfilaments.
 (iv) Structure and activation of GPCRs.
2. (a) Do as directed (any three) :- 3
 (i) Fill in the blank : _____ is a normal occurrence in which an orchestrated sequence of events leads to the death of a cell.
 (ii) Write True/False :- Sphingomyelin is present mainly in the inner layer of the RBC membrane.
 (iii) Give the role of - FAK.
 (iv) Define - Plasmolysis.
 (v) Give one example of - Glycosaminoglycans.
 (vi) Explain - Apoptosome.
- (b) Attempt any two of the following :- 12
 (i) What are caspases ? Describe their targets.
 (ii) Outline the general functions of the cell membrane.
 (iii) Give an account of tight junction as a differentiation of the cell membrane.
 (iv) Explain the theories proposed for cell to cell adhesion.
3. (a) Explain any one of the following :- 2
 (i) Co-culture. (ii) Anchorage dependent cells.
- (b) Name any one of the following :- 1
 (i) Equipment used in sterilization of medium for animal tissue culture.
 (ii) Cryopreservant used for storage of animal tissues for several years.

3. (c) Discuss any two of the following :-
- (i) Tissue culture and its applications in various fields.
 - (ii) Design and layout of animal tissue culture laboratory.
 - (iii) Types of biosafety cabinets.
 - (iv) Principle and significance of CO₂ incubator and hot room.
4. (a) Give significance of any three of the following in animal tissue culture :-
- (i) Eagle's MEM.
 - (ii) Glutathione.
 - (iii) Dissociation enzymes.
 - (iv) Feederlayers.
 - (v) Irradiation.
 - (vi) Transformed cell lines.
- (b) Answer any two of the following :-
- (i) State the constituents of serum and its role in Animal tissue culture media.
 - (ii) Discuss the advantages of serum free media.
 - (iii) Explain two methods of establishing organ culture.
 - (iv) State the procedure adopted to grow primary culture of any two specialized tissues.
5. Write short notes on any three of the following :-
- (i) Nucleation and time course of cytoskeletal polymelization.
 - (ii) Extracellular messenger.
 - (iii) Extrinsic pathway of apoptosis.
 - (iv) Passive permeability.
 - (v) Tissue culture vessels.
 - (vi) Types of stem cells with respect to its potency.