QP Code : 12811

(2½ Hours) [Total Marks : 75

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) Microtubule monomers
(ii) Microfilament polymerising protein
(iii) Second messengers
(iv) Heterotrimeric G protein
(v) Microfilament severing protein
(vi) Natural ligands of GPCRs

(b) Give an account of any **two** of the following :— 12
(i) Role of microtubules in mitosis.
(ii) Mechanism for activation of RTKs.
(iii) Types of Intermediate filaments.
(iv) Motor proteins associated with microfilaments.

2. (a) Define any **three** of the following :— 3
(i) Permeability
(ii) Glycocalyx
(iii) Caspases
(iv) Desmosomes
(v) Osmosis
(vi) Apoptosome

(b) Attempt any **two** of the following :— 12
(i) Outline the structure of the plasma membrane of an RBC.
(ii) Explain the theories proposed for cell-cell adhesion.
(iii) What is apoptosis ? Comment on its significance.
(iv) Describe carrier proteins on the basis of solutes transported.

3. (a) Explain any **one** of the following :— 2
(i) HEPA filters
(ii) Co culture

(b) Name any **one** of the following :— 1
(i) Tissue culture vessel made up of glass with flattened surface on one side near the bottom fitted with right sized coverslip.
(ii) The Equipment used to pipette out solutions in microliter volume.

(c) Discuss any **two** of the following :— 12
(i) Advantages of animal tissue culture.
(ii) Incubation facilities in an animal tissue culture laboratory.
(iii) Principle and working of an autoclave.
(iv) Storage facilities in an animal tissue culture laboratory.

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4. (a) Give significance of any three of the following :— 3
   (i) Trypsin
   (ii) Hank's BSS
   (iii) Nystatin
   (iv) Inner Cell Mass
   (v) Organ culture
   (vi) Primordial germ cells

   (b) Answer any two of the following :— 12
   (i) Give an account of physiochemical properties of tissue culture media
   (ii) Discuss the advantages of Serum free media.
   (iii) Schematically explain the protocol to establish primary cell culture.
   (iv) Give the biological characteristics of EC and ES cell lines.

5. Write short notes on any three of the following :— 15
   (i) Topology of GPCRs
   (ii) MAPs
   (iii) Tight junctions
   (iv) Intrinsic pathway of apoptosis
   (v) Biosafety cabinets
   (vi) Uses of stem cells.

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