Q.3A) State True or False: (04)

(i) The study of structure and function of the total protein component of the cell is called metabolics.
(ii) Animal and plant studies have no specific advantage to study.
(iii) Histology means study of plants.
(iv) Cell disruption is a method or process for releasing biological molecules from outside a cell.

Q.3B) Write short notes on: (Any three) (09)

(i) Enzymatic permeabilization
(ii) Solid shear
(iii) Counting cells
(iv) Importance of biochemical investigation.
(v) *Arabidopsis thaliana* as an experimental model.
(vi) Laser capture microdissection.

Q.3C) Answer the following: (Any two) (12)

(i) Write an elaborate note on *C. elegans* and *Dictyostelium* as model organisms.
(ii) With the help of a flow chart describe the steps involved in isolation of different cell organelles using centrifugation.
(iii) Write a note on automated and indirect cell counting.
(iv) Write a detailed note on cell separation on the basis of its density.

Q.4A) Define and explain: (Any five) (10)

(i) Ball mills
(ii) Effect of temperature on enzymatic reaction.
(iii) Apical Meristem
(iv) Diffusion
(v) Effect of substrate concentration on enzymatic reaction.
(vi) Activation energy.
(vii) Homogenizer

Q.4B) Write short notes on: (Any three) (15)

(i) Enzyme kinetics
(ii) Single and bi-substrate reaction.
(iii) Structure of vasopressin and its physiological role.
(iv) Write a difference between progesterone and follicle stimulating hormone
(v) *E.coli* as a model organism.
(vi) Biochemical investigation of vertebrates.

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Note:

1. All the questions are compulsory. Choice is internal.
2. Figures to the right indicate full marks.
3. All questions carry equal marks.
4. Draw flowcharts/diagrams wherever necessary.

Q.1A) State True or false: (04)

(i) Ribozyme is an enzyme.
(ii) The enzyme which hydrolyses starch to maltose is amylase.
(iii)NAD acts as a cofactor.
(iv)If a reaction depends upon the shape of catalyst, size of reactant and product molecules then the reaction is called shape-selective catalysis.

Q.1B) Write short notes on: (Any three) (09)

(i) Enzymes and its classification.
(ii) Properties that differentiate an enzyme from a catalyst.
(iii)Enzymes that join the ends of two strands of nucleic acids.
(iv)Biological catalyst.
(v) Role enzymes in the preparatory phase of glycolysis.
(vi)Role of enzymes in the payoff phase of glycolysis.

Q.1C) Write elaborate notes on: (Any two) (12)

(i) Mechanism of enzyme reaction.
(ii) Enzyme classification.
(iii) Reversible enzyme inhibition and non-reversible enzyme inhibition.
(iv) Glycolysis

Q.2A) State True or False: (04)

(i) Ethylene is not a plant growth hormone.
(ii) ACTH is an endocrine hormone.
(iii) FSH secreted by ovary.
(iv)The chemical name of T_3 is thyroxine.

Q.2B) Answer the following: (Any three) (09)

(i) Senescence
(ii) Autocrine
(iii)Luteinizing hormone
(iv)Function of ADH
(v) Endocrine hormone
(vi)Gibberellin.

Q.2C) Answer the following: (Any two) (12)

(i) Write difference between endocrine and exocrine gland.
(ii) Explain in detail the mode of action of water soluble hormones.
(iii)Describe the hierarchy of the endocrine system.
(iv)Enlist the function of thyroxine.