

Total No. of Questions : 6]

SEAT No. :

**P1424**

**[5124]-11**

[Total No. of Pages : 2

**M.Sc.**

**BIOCHEMISTRY**

**BCH - 170 : Biomolecules**

**(2008 - 2010 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answers to both sections should be written on separate answer sheets.*
- 2) *All questions are compulsory.*
- 3) *Figures to right indicate full marks.*

**SECTION - I**

**Q1) Explain the following (any 5):** **[15]**

- a) Weak bases with examples.
- b) Sugar acids with example and features.
- c) Miscelle formation & characteristics.
- d) Anomers, epimers, coenzymes.
- e) Acid number and its relation with rancidity.
- f) Distinguish between water and fat soluble vitamins.

**Q2) Answer any three of following:** **[15]**

- a) Write note on lipoproteins.
- b) Give biological significance of carbohydrates.
- c) Compare LDL, VDL, HDL.
- d) Formation of Macromolecules from their Monomeric subunits.

***P.T.O.***

**Q3)** Write notes on any two of following: [10]

- a) Ionization of water.
- b) Fat soluble vitamins.
- c) Reactions of glucose with oxidising & reducing agents and their significance.

### SECTION - II

**Q4)** Explain the following (any 5): [15]

- a) Isoelectric point and its significance.
- b) Rare amino acids with example.
- c) Significance of disulphide bonds and ionic interaction in maintaining three dimensional structure of protein.
- d) Denaturation and its significance.
- e) Draw structure of Asparagine, Glutamate, Arginine.

**Q5)** Answer any three of following: [15]

- a) Explain force stabilizing tertiary structure of proteins.
- b) Write note on Ramchandran plot.
- c) Amino acids act as acids and bases. Explain.
- d) Explain  $\alpha$ -helical structure of proteins.

**Q6)** Write note on any two: [10]

- a) Glycine titration curve.
- b) Quaternary structure of protein.
- c) Steps involved in determination of primary structure of proteins.



Total No. of Questions : 9]

SEAT No. :

**P1425**

[5124]-12

[Total No. of Pages : 3

M.Sc.

**BIOCHEMISTRY**

**BCH - 171: Enzymology & Physiological Biochemistry**

**BCH - 171: Enzymology & Biophysical Techniques**

**(2010 Pattern and 2008 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answer to both the sections should be written on separate answer sheets.*
- 3) *Figures to the right indicate full marks.*

**SECTION - I**

(Enzymology)

**Q1)** Answer any three of the following: **[15]**

- a) Discuss in detail the effect of substrate concentration on enzyme catalyzed reaction.
- b) What is substrate cycle? Explain with suitable example.
- c) Describe the various method used for determination of active site.
- d) Write a note on Stopped flow techniques.

**Q2)** Attempt any three of the following. **[15]**

- a) Describe the classification of enzymes with example.
- b) What are zymogens? Describe its role.
- c) Define the terms:  $K_m$  and  $K_{cat}$ . What is their significance?
- d) Write a note on mechanism of enzyme degradation.

**Q3)** Answer any two of the following: **[10]**

- a) Explain the mechanism of action of chymotrypsin.
- b) Describe allosteric behavior of phosphofructokinase.
- c) Explain acid-base and covalent catalysis.

**P.T.O.**

## **SECTION - II**

(Physiological Biochemistry)

(2008 Pattern)

**Q4)** Answer any three of the following: **[15]**

- a) Describe the function of Kidney as an endocrine gland.
- b) What is alkalosis? What are the compensatory mechanisms during alkalosis?
- c) Explain the salient features of the carbonic acid-bicarbonate buffer system.
- d) Write a note on plasma proteins and their diseases.

**Q5)** Attempt any three of the following: **[15]**

- a) Describe the role of the antidiuretic hormone in kidney function.
- b) Write a note on buffer systems in the intracellular and extracellular fluids.
- c) Describe the formation of bile pigments. What is the clinical significance of their elevated levels in serum?
- d) What is blood counting? Explain its significance.

**Q6)** Answer any two of the following. **[10]**

- a) Write a note on detoxification of foreign substances by liver.
- b) Explain the effect of 2,3 bisphosphoglycerate and pH on binding of oxygen by hemoglobin?
- c) What is the composition of bile juice? How are gall stones formed.

## **SECTION - II**

(Biophysical Techniques)

(2010 Pattern)

**Q7)** Answer any three of the following: **[15]**

- a) Describe any one application of UV-VIS spectrometer with example.
- b) What is covalent chromatography? Give its application.

- c) Why it is necessary to purify enzyme? How enzymes are separated on the basis of their solubility?
- d) How electrophoresis can be combined with chromatography? Explain with suitable example.

**Q8)** Attempt any three of the following: **[15]**

- a) Write a note on reverse dialysis.
- b) Describe the any one application of gel electrophoresis.
- c) What is restriction mapping? Give its principle.
- d) Explain the methods of paper chromatography.

**Q9)** Answer any two of the following: **[10]**

- a) Write a note on affinity chromatography.
- b) Describe the principle of gas chromatography.
- c) Explain the components of HPLC.



Total No. of Questions :6]

SEAT No. :

[Total No. of Pages :4

**P1426**

[5124] - 13

M.Sc.

**BIOCHEMISTRY**

**BCH-172: Microbiology & Cell Biochemistry of Eukaryotes**

**(2010 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *Answer to both sections should be written in separate answer books.*
- 2) *All questions are compulsory.*
- 3) *Figures to the right side indicate full marks.*

**SECTION -I**

**(Microbiology)**

**Q1)** Answer any three of the following:

**[15]**

- a) What is mode of action of phenal.
- b) What are the general methods of classifying bacteria? Add a note on nomenclature.
- c) What are exatoxins? Explain with suitable examples.
- d) Enlist the methods of isolation of pure culture. Add note on streak plate methods.
- e) Distinguish between prokaryotic & eukaryotic cell.

**Q2)** Explain the following (any three):

**[15]**

- a) Gram staining method.
- b) Lysogeny & lytic cycle of bacterial virus.
- c) Fluorescence microscopy.
- d) Anti microbial agents.
- e) Classification of viruses.

***P.T.O.***

**Q3)** Write note on any two: [10]

- a) Symbiotic nitrogen fixation.
- b) Pour plate technique & its limitation.
- c) Moist heat sterilization.

**SECTION -II**

**(Cell Biochemistry of Eukaryotes)**

**Q4)** Answer any three of the following: [15]

- a) Explain structure & function of nucleus.
- b) Write note on subcellular fractionation.
- c) Explain phases of meiosis.
- d) Write note on classification of cell on basis of cell variability in shape & complexity.
- e) Write note on cell junction.

**Q5)** Answer any three of the following: [15]

- a) Write note on fungi cell structures. Add note on biological importance.
- b) Write note on cell-cell communication between plant cell.
- c) Write note on spermatogenesis and oogenesis with examples.
- d) Explain ultra structure of plasma membrane.

**Q6)** Write note on any two: [10]

- a) Differential & density gradient centrifugation.
- b) Distinguish between active & passive transport.
- c) Define cell cycle. Elaborate on difference between mitosis & meiosis.

*EEE*

Total No. of Questions :6]

**P1426**

**[5124] - 13**

**M.Sc.**

**BIOCHEMISTRY**

**BCH-172: Cell Biochemistry**

**(2008 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) Answer to both sections should be written in separate answer books.*
- 2) All questions are compulsory.*
- 3) Figures to the right side indicate full marks.*

**SECTION -I**

**(Cell Biochemistry - I)**

**Q1)** Answer any three of the following: **[15]**

- a) Explain principle & applications of fluorescent microscopy.
- b) Enlist methods for isolation of pure culture. Give streak plate method in detail.
- c) Write note on replication of bacterial viruses.
- d) Explain streak plate method. Give its limitation and applications.
- e) Discuss methods for cultivation of anaerobic bacteria.

**Q2)** Explain the following (any three): **[15]**

- a) TEM.
- b) Virioids.
- c) Exotoxins.
- d) Lytic cycle of bacterial viruses.



**Q3) Write note on any two: [10]**

- a) Freeze fracture.
- b) Cell wall of bacteria.
- c) Negative & differential staining.

**SECTION -II**

**(Cell Biochemistry -II)**

**Q4) Answer any three of the following: [15]**

- a) What is cell cycle? Explain meiosis phases.
- b) Write note on cell classification.
- c) Explain complexity & function of cell.
- d) Distinguish between xylem and phloem.
- e) Explain cell differentiation in brief.

**Q5) Answer any three: [15]**

- a) Elaborate structure of plasma membrane. Add note on its functions.
- b) What are major groups of fungi. Add note on its biological functions.
- c) What is cell communication.
- d) Compare and explain active & passive transport.

**Q6) Write note on any two: [10]**

- a) Organogenesis.
- b) Ultra centrifugation.
- c) Ultra structure of chloroplast.

*EEE*

Total No. of Questions : 6]

SEAT No. :

**P1427**

**[5124]-21**

[Total No. of Pages : 2

**M.Sc.**

**BIOCHEMISTRY**

**BCH-270: Bioenergetics & Metabolism  
(2008 & 2010 Pattern) (Semester-II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer to both sections should be written on separate answer sheets.*
- 2) *All questions are compulsory.*
- 3) *Figures to the right indicate full marks.*

**SECTION-I**

**Bioenergetics & Metabolism-I (2008 Pattern)**

**Bioenergetics & Metabolism-I (2010 Pattern)**

**Q1)** Answer any three of following: **[15]**

- a) Explain second law of Thermodynamics. Derive its equation form.
- b) Explain glycolysis and its regulation.
- c) Explain significance and energetics of citric acid cycle.
- d) Write note on inborn errors of carbohydrate metabolism.

**Q2)** Answer any three of following: **[15]**

- a) Explain Pentose phosphate pathway.
- b) Write note on significance of ATP in cell.
- c) Explain role of chloroplast in photosynthesis. Draw its structure.
- d) Explain Ketone bodies.

**Q3)** Write notes on any two: **[10]**

- a) Chemiosmotic hypothesis.
- b) Bacterial photosynthesis.
- c) Amphibolic nature of TCA cycle.

***P.T.O.***

## SECTION-II

Metabolism II: Nitrogen Metabolism (2008 Pattern)

Bioenergetics and Metabolism II (2010 Pattern)

**Q4)** Answer any three of following: **[15]**

- a) Write note on Urea Cycle & its regulation.
- b) What is decarboxylation of amino acid.
- c) Explain degradation of purine nucleotides.
- d) Explain biosynthesis of histidine.

**Q5)** Answer any three: **[15]**

- a) Write note on nitrogenase system.
- b) Give regulation pyrimidine nucleotide biosynthesis.
- c) What is oxidative deamination of amino acids.
- d) Explain gamma glutamyl cycle & its significance.

**Q6)** Write notes on any two: **[10]**

- a) Fate of uric acid in different animals.
- b) Ribonucleotide reductase.
- c) Non ribosomal protein biosynthesis.



Total No. of Questions : 6]

SEAT No. :

**P1428**

[5124]-22

[Total No. of Pages : 4

M.Sc.

**BIOCHEMISTRY**

**BCH:271:Techniques For Characterization of Biomolecules  
(2010 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Answer section I and section II on Separate answer sheet.*

**SECTION - I**

**(Biophysical Techniques)**

**Q1)** Answer any three of the following: **[15]**

- a) Write short note on density gradient centrifugation.
- b) How standard sedimentation coefficient is determined.
- c) Write a note on X-ray diffraction.
- d) What is quenching? List out the factors that are involved in quenching.
- e) Explain atomic absorption spectrophotometer.

**Q2)** Answer any three of the following : **[15]**

- a) Explain any one method for determination of molecular weight by sedimentation diffusion and sedimentation equilibrium method.
- b) Explain how partial specific volume and diffusion coefficient are correlated.
- c) Explain liquid scintillation counting.
- d) Discuss the factor that affects the resolution of autoradiography.
- e) Explain isotope tracer techniques and types of radiation.

**Q3)** Write short notes on (any two): **[10]**

- a) Gamma counter.
- b) Radiolysis of water.
- c) Pycnometer.

**P.T.O.**

## SECTION-II

### (Structure Determination of Biomolecules)

**Q4)** Answer any three of the following: **[15]**

- a) Draw the schematic diagram of NMR and explain its principle and working.
- b) Explain the major application of biosensors in environmental pollution monitoring.
- c) ORD and CD are manifestation of the same phenomenon. Justify.
- d) Describe the theory of LCMS. Enumerate the application.
- e) Discuss instrumental features of IR spectroscopy. Explain the application of IR spectra to biomolecules.

**Q5)** Answer any three of the following: **[15]**

- a) Describe the working and application of ESR.
- b) Give the difference between MALDI-MS and MALDI TOFMS. Describe the role of matrix.
- c) Explain the phenomenon and application of fluorescence.
- d) Explain the principle and application of GCMS.
- e) Which transducer system is suitable for development of urea biosensor? Why?

**Q6)** Write short note on any two of the following: **[10]**

- a) Application of fluorescence in cell biology.
- b) Difference between ORD & CD.
- c) Application of NMR.



Total No. of Questions : 6]

**P1428**

**[5124]-22**

**M.Sc.**

**BIOCHEMISTRY**

**BCH:271:Biophysical Techniques**

**(2008 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Answer section I and section II on Separate answer sheet.*

**SECTION - I**

**(Biophysical Techniques - I)**

**Q1)** Answer any three of the following: **[15]**

- a) Write a note on principle and application of dialysis. Give the importance of reverse dialysis.
- b) Explain the steps involved in determination of molecular weight of proteins by SDS-PAGE.
- c) Give the principle of chromatography with its different type.
- d) Give the difference between membrane filtration and dialysis.
- e) Principle, working and application of IR.

**Q2)** Answer any three of the following : **[15]**

- a) What is the special chromatographic techniques used for isolation of nucleic acid. Explain.
- b) Give the principle and working of HPLC as aminoacid analyzer.
- c) Listout the significance of Gelpermeation chromatography with its principle.
- d) How are DNA fragments separated in agarose gel electrophoresis.
- e) Define isoelectric pH. Give the principle of isoelectric focussing.

- Q3)** Write a short note on (any two): **[10]**
- a) Hydrophobic chromatography.
  - b) Methods of ligand immobilization.
  - c) Pulsed-field electrophoresis.

**SECTION-II**  
**(Biophysical Techniques - II)**

- Q4)** Answer any three of the following: **[15]**
- a) What are the factors that affect sedimentation velocity. Describe any one in detail.
  - b) With the help of viscometry. How will you prove that certain substances can intercalate between nucleotids bases of DNA?
  - c) Discuss the factor that affect the resolution of autoradiography.
  - d) How standard sedimentation coefficient is determined.
  - e) Explain atomic absorption spectrophotometer.

- Q5)** Answer any three of the following: **[15]**
- a) Distinguish between boundary and hard sedimentation.
  - b) How the types of radiation are used in Biochemistry. Explain.
  - c) Explain the methods for determination of molecular weight by sedimentation diffusion.
  - d) How will you measure partial specific volume by pycnometer?
  - e) Explain the measurement of viscosity by Zimm Gother's viscometer.

- Q6)** Write short notes on any two : **[10]**
- a) Liquid scintillation counting.
  - b) Effect of friction on sedimentation.
  - c) Radiolysis of water.



Total No. of Questions : 6]

SEAT No. :

**P1429**

**[5124]-23**

[Total No. of Pages : 2

**M.Sc.**

**BIOCHEMISTRY**

**BCH:273:Membrane Biochemistry & Nucleic Acid (2008 Pattern)**

**BCH:273:Membrane Biochemistry & Genetics (2010 Pattern)**

**(Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw neat labelled diagrams wherever necessary.*
- 5) *Answer to both sections should be written on separate answer sheets.*

**SECTION - I**

**(Membrane Biochemistry) (2008 Pattern)**

**(Membrane Biochemistry) (2010 Pattern)**

**Q1)** Answer any three of following:

**[15]**

- a) Write in detail role of Na-K-ATPase in membrane transport.
- b) Explain specialized mechanism for transport of macromolecules.
- c) Explain with a labelled diagram biological membrane.
- d) Write in detail receptor mediated endocytosis.

**Q2)** Attempt any three :

**[15]**

- a) Explain structure & function of nuclear Pores.
- b) Write note on bacterial toxins.
- c) What is photo-transferase system.
- d) Explain mechanism and role of valinomycin.

***P.T.O.***



- Q3)** Write notes on any two: [10]
- a) ATP - ADP exchanger system.
  - b) Protein targetting
  - c) Membrane assymetry.

**SECTION - II**

**(NuclicAcids) (2008 Pattern)**

**(Genetics) (2010 Pattern)**

- Q4)** Answer any three of the following : [15]
- a) What is specialized transduction? How it differs from generalized transduction.
  - b) Write note on Mendelian law of inheritance with examples.
  - c) Write short on different forms of DNA.
  - d) Discuss experiment to prove DNA as genetic material.

- Q5)** Answer any three the following : [15]
- a) DNA replication is semiconservative. Explain.
  - b) What are auxotrophs and prototrophs. Add note on application of auxotrophs.
  - c) Give regulation of lactase operon. Add note on its functions.
  - d) Explain complementation test

- Q6)** Write note on any two : [10]
- a) Tetrad analysis.
  - b) One-gene-one cistron.
  - c) Plasmids & their types.



Total No. of Questions : 4]

SEAT No. :

**P1430**

**[5124]-31**

[Total No. of Pages : 2

**M.Sc.**

**BIOCHEMISTRY**

**BCH - 370 : Molecular Biology  
(2008 and 2010 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to right indicate full marks.*

**Q1)** Answer any four of the following: **[20]**

- a) What are retrotransposons? Give their mechanism of transposition.
- b) What is DNA methylation? Give its significance.
- c) Explain pyrimidine dimer formation and its repair.
- d) Write note on role of shine and Dalgarno sequence and its significance.

**Q2)** Attempt any two of following: **[20]**

- a) Explain in detail base excision repair mechanism.
- b) Write note on mitochondrial protein transport.
- c) Write note on inhibitors of transcription process.

**Q3)** Answer any four of following: **[20]**

- a) Explain mRNA capping. Give its role and significance.
- b) Explain clover leaf structure of t-RNA.
- c) DNA replication is semiconservative. Explain.
- d) Write note on types of RNA polymerases and their role in brief.

**P.T.O.**

**Q4)** Write short notes on any four of following:

**[20]**

- a) Need and Mechanism of splicing.
- b) SOS response.
- c) Protein targetting.
- d) Okazaki fragments.
- e) Role of RecA, RuvB, RuvA, RuvC in recombination.



Total No. of Questions : 6]

SEAT No. :

**P1431**

**[5124]-32**

[Total No. of Pages : 3

**M.Sc.**

**BIOCHEMISTRY**

**BCH - 371: Medical Biochemistry and Immunology  
(2008 Pattern and 2010 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Answers to the two sections should be written on separate answer books.*

**SECTION - I**

**(Medical Biochemistry)**

**Q1) Answer any three of the following: [15]**

- a) Write the normal composition of CSF and list out two abnormal components that are seen in CSF during pathological conditions.
- b) What is the role of viruses in carcinogenesis.
- c) Give the features of hallucinogenes.
- d) Explain the biochemical basis of sickle cell anaemia.
- e) Elaborate on types of Influenza.

**Q2) Answer any three of the following. [15]**

- a) Elaborate on causative agents that lead to carcinogens.
- b) Discuss the role of clotting factor involved in Thrombus formation.
- c) Define the term analgesics. Give their mechanism of action.
- d) Discuss the mechanism of action of Streptomycin and Tetracycline.
- e) Explain  $\alpha$  -thalassemias pathophysiology.

***P.T.O.***

**Q3)** Write notes on any two of the following: [10]

- a) Apoptosis.
- b) Hydrolytic enzymes of lysosomes.
- c) LSD.
- d) Role of isoenzymes in the diagnosis of heart diseases.

## **SECTION - II**

### **(Immunology)**

**Q4)** Answer any three of the following: [15]

- a) Enlist types of Immunity and explain how different cells are involved in generation of immunity.
- b) Elaborate the steps involved in producing monoclonal antibodies.
- c) List out some examples of auto immune diseases. Explain the mechanism of development of auto immunity.
- d) Describe primary and secondary lymphoid organs and their significance with neat diagram.
- e) What are live and attenuated vaccines? Explain the principle of vaccination.

**Q5)** Answer any three of the following: [15]

- a) Classify immuno diffusion techniques and elaborate on the procedure.
- b) List out different classes of antibodies and give their features.
- c) Differentiate between competitive ELISA and sandwich ELISA. List out the advantages of ELISA techniques over RIA.
- d) What are hypersensitivity? List out the four major types of hypersensitivity reaction and discuss their features.
- e) Where do T Cells and B cell mature in body? How are they responsible for immunity in the body.

**Q6)** Write notes on any two of the following.

**[10]**

- a) Anaphylaxis.
- b) AIDS.
- c) Interferons.
- d) Graft rejection.



Total No. of Questions : 4]

SEAT No. :

**P1432**

**[5124]-33**

[Total No. of Pages : 4

**M.Sc.**

**BIOCHEMISTRY**

**BCH - 372: Neurochemistry  
(2010 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw necessary diagrams wherever necessary.*

**Q1)** Answer any *four* of the following.

**[20]**

- a) Describe the organizations of CNS.
- b) Write a note on synthesis and trafficking of neutral proteins.
- c) What are voltage gated ion channels? Explain their functions with example.
- d) Explain the steps involved in the generation of action potential.
- e) Write a note on intracellular messengers.

**Q2)** Attempt any *two* of the following:

**[20]**

- a) Describe the synthesis, storage, degradation and action of glutamate.
- b) What are neurotransmitters? Define the characteristics of neurotransmitters.
- c) Explain the steps involved in the synaptic transmission.

**Q3)** Answer any *two* of the following:

**[20]**

- a) Contrast the generation and conduction of graded potentials with that of action potentials.
- b) What are the types of receptors involved in sensory perception? Explain with example.
- c) Describe the structure and function of synapse.

**P.T.O.**

**Q4)** Write a short notes on (any four)

**[20]**

- a) Nerve cells and behavior.
- b) Long term potentiation.
- c) Biochemistry of touch.
- d) Cerebrospinal fluid.
- e) Sensory modalities.





Total No. of Questions : 6]

**[5124]-33**  
**M.Sc.**  
**BIOCHEMISTRY**  
**BCH - 372: Signal Transduction Pathways**  
**(2008 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) All questions are compulsory.*
- 2) Answers to both the sections should be written on separate answer sheets.*
- 3) Figures to the right indicate full marks.*

**SECTION - I**

(Signal Transduction Pathways - I)

**Q1)** Answer any *two* of the following: **[10]**

- a) Describe the role of acetyl choline esterase.
- b) Write a note on muscle contraction.
- c) Describe in detail the primary events in visual cycle.

**Q2)** Attempt any *three* of the following: **[15]**

- a) Give a short account on the propagation of nerve impulse.
- b) What is chemotaxis? Describe the functions of proteins involved in signal transduction pathway.
- c) Explain the biochemical mechanism of taste.
- d) What is rhodopsin? Describe the structural properties of rhodopsin.

**Q3)** Write a short notes on (any three): **[15]**

- a) Biochemistry of hearing.
- b) Nerve poisons.
- c) Rods and cones.
- d) Metabolism of muscle.

## **SECTION - II**

(Signal Transduction Pathways - II)

**Q4)** Attempt any *two* of the following: **[10]**

- a) Explain the mechanisms proposed for short term and long-term memory storage.
- b) Describe the ionic basis for inhibitory and excitatory post-synaptic potentials and how these changes can alter synaptic transmission.
- c) Discuss the localization of higher functions of the brain.

**Q5)** Attempt any *three* of the following: **[15]**

- a) Describe ionic basis of an action potential.
- b) Write a note on coordination of nervous and endocrine systems.
- c) Describe the organization of central nervous system and peripheral nervous system.
- d) Explain the steps involved in the transmission of nerve impulse across the synapse.

**Q6)** Write a short notes on (any three): **[15]**

- a) Neuropeptides.
- b) Blood brain barrier.
- c) Neural plasticity.
- d) Calcium signaling.



Total No. of Questions : 4]

SEAT No. :

**P1433**

**[5124]-34**

[Total No. of Pages : 2

**M.Sc.**

**BIOCHEMISTRY**

**BCH - 373 : Biochemical Toxicology**

**(2010 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to right indicate full marks.*

**Q1)** Answer any five of the following:

**[20]**

- a) Explain medical applications of toxicology.
- b) Give classification of toxic agents.
- c) Give impact of organophosphorus carbamate on ecosystem.
- d) Explain pathogenesis of hypotension. Give its clinical manifestation.
- e) Compare the inhibition of acetylcholinesterase caused by organophosphorus & carbamate insecticides.
- f) Explain component of cytochrome P450 monooxygenase system.

**Q2)** Answer any five of following:

**[20]**

- a) Explain carcinogenicity of arsenic.
- b) How will you evaluate toxicity of a substance?
- c) Write note on teratology & reproduction.
- d) Give pathogenicity & clinical manifestation of bile stasis.
- e) What is impact of chlorinated insecticides.
- f) Distinguish between reversible & irreversible toxicity.

**P.T.O.**

**Q3)** Answer any four of following:

**[20]**

- a) Write note on Dose-response relationship.
- b) Explain with example animal & plant toxins.
- c) Give mechanism of phase I and phase II reactions.
- d) What are toxic effects of Ozone and peroxyacetyl nitrate.
- e) Compare & explain toxication & detoxication reactions.

**Q4)** Write notes on any four:

**[20]**

- a) AIMS test.
- b) Principles of toxicology.
- c) Biotransformation mechanism catalyzed by N-acyltransferase.
- d) Toxic effects of organophosphorus insecticides.
- e) Plant and animal toxins.

**x x x**

Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages :3

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**[5124]-41**

**M.Sc.**

**BIOCHEMISTRY**

**BCH-470: Biochemical Endocrinology and Tissue Culture**

**(2008 Pattern)**

**Biochemical Endocrinology and Plant Biochemistry**

**(2010 Pattern)**

**(Semester-IV)**

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Solve section-I and section-II on separate answer sheet.*

**SECTION-I**

**(Biochemical Endocrinology)**

**Q1) Answer any three of the following: [15]**

- a) Give the structural aspects of glucocorticoid hormone.
- b) Give the physiological role of prolactin
- c) Give the pathogenesis of Grave's disease
- d) Describe the metabolic conversion that are required to produce active form of calcitriol
- e) Explain the deficiency manifestations of insulin and thyroid hormone.

**Q2) Answer any three of the following: [15]**

- a) Discuss the physiological role and deficiency syndrome of mineralocorticoids
- b) Give an account of enterophalim and endorphin.
- c) How hormone sensitivity of target cell identified?
- d) Discuss the mode of action of gastrointestinal hormone with example.
- e) Describe role of growth hormone on carbohydrate metabolism.

**Q3)** Answer any two of the following: **[10]**

- a) Write a note on Zn- finger.
- b) Explain the role of glucagon.
- c) Note on parathyroid hormone.

### **SECTION-II**

#### **(Tissue Culture) (2008 Course)**

**Q4)** Answer any three of following: **[15]**

- a) What are advantages & disadvantages of synthetic media
- b) What is embryoculture? Give its method & applications.
- c) Explain role of secondary metabolites with example
- d) Explain terms cybrids, hybrids, haploid culture, micropropagation.
- e) What are disinfectants? Give types with examples.

**Q5)** Answer any three of following: **[15]**

- a) Explain meaning of suspension culture and add note on its application & limitation.
- b) Explain what are transformed cells? Give their characteristics
- c) Describe in detail different cell culture methods
- d) What are different methods of animal cell preservation.

**Q6)** Write short note on any two: **[10]**

- a) Hairy rood culture
- b) Sterilization
- c) Protoplast fusion methods
- d) Anther culture.

## SECTION-II

### (Plant Biochemistry) (2010 Pattern)

**Q4)** Answer any three of following: **[15]**

- a) What are plant hormones? Give role in plant development
- b) Explain localization of photosystems in thylakoid membrane
- c) Give the role of iron and manganese in plant growth
- d) What is plant breeding? Give applications of plant breeding in crop improvement with example.
- e) What is cryopreservation? Explain.

**Q5)** Explain the following (any three): **[15]**

- a) Role of nitrogen as plant nutrient
- b) Somatic hybridization
- c) Calvin cycle
- d) Isolation of protoplast
- e) Cyclic & non-cyclic electron flow in photosynthesis

**Q6)** Write note on any two: **[10]**

- a) Role of ethylene oxide in fruit ripening
- b) Preparation of explants.
- c) Oxygenase activity of Rubisco



Total No. of Questions : 4]

SEAT No. :

**P1435**

**[5124]-42**

[Total No. of Pages : 1

**M.Sc.**

**BIOCHEMISTRY**

**BCH:472: Genetic Engineering  
(2010 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

**Q1)** Answer any four of following: **[20]**

- a) Explain role of ligases and alkaline phosphatase.
- b) Write note on bacteriophage as vector in genetic engineering.
- c) Write note on immunological methods for selection of recombinants.
- d) Explain Northern blotting.
- e) Explain different methods of transfection.

**Q2)** Answer any four: **[20]**

- a) What is meant by transgenic animals? Explain with example.
- b) Give application of microarray.
- c) Give the methods in protein engineering.
- d) What is cDNA library? Give method for its construction.

**Q3)** Answer any four of following: **[20]**

- a) Explain replica plating and its application.
- b) Explain M13 bacteriophage vector.
- c) Give applications of PCR.
- d) What is chromosome walking.

**Q4)** Write note on any four of following: **[20]**

- a) Epigenetics.
- b) Cosmids.
- c) Microarray
- d) Blue white screening





Total No. of Questions : 6]

SEAT No. :

**P1436**

**[5124]-43**

[Total No. of Pages : 2

**M.Sc.**

**BIOCHEMISTRY**

**BCH - 471: Fermentation and Enzymes Technology and Food  
Technology (2008 Pattern)**

**Fermentation Technology and Food Technology (2010 Pattern)  
(Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Draw Neat diagrams wherever necessary.*
- 3) *Answers to the two sections should be written on separate answer sheets.*

**SECTION - I**

**(Fermentation and Enzyme Technology)**

**Q1) Explain any three of the following: [15]**

- a) Continuous culture
- b) Media Optimization
- c) Antifoam
- d) Isolation of auxotrophic mutants.
- e) Physical treatment of effluent

**Q2) Answer any three of the following : [15]**

- a) What are different nitrogen source that are used in fermentation?
- b) What are different methods or criteria for isolation of industrially important micro organism?
- c) What are various methods of feedback control?
- d) What are the basic requirements for expression of foreign DNA in Microbes?
- e) How product is recovered by chromatographic techniques?

***P.T.O.***

- Q3)** Write notes on any two: **[10]**
- a) Difference between batch culture and continuous culture.
  - b) Oxygen requirement for industrial fermentation.
  - c) Effect of precursor in fermentation.
  - d) Methods of strain improvement.

**SECTION - II**  
**(Food Technology)**

- Q4)** Attempt any three of the following : **[15]**
- a) Explain why brown bread is better preferred than white bread.
  - b) Explain the role and significance of various food preservatives.
  - c) What are the different enzymes used for food analysis. Explain.
  - d) Discuss in detail the process of preparation of clear and cloudy juice.
  - e) How will you monitor food quality.

- Q5)** Attempt any three of the following : **[15]**
- a) What are flavouring agents? Why are they essential in food industry.
  - b) Elaborate on various types of food additives.
  - c) Why meat tenderisation is important. Explain the role of trypsin in meat tenderisation.
  - d) Discuss the role of enzymes in food processing with suitable examples.
  - e) Explain the process of genetic modification of food.

- Q6)** Write short notes on any two of the following: **[10]**
- a) Biochemistry of food spoilage.
  - b) Single cell protein.
  - c) Natural and Synthetic Syrups.

