

Total No. of Questions :6]

SEAT No. :

[Total No. of Pages :2

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[5224] - 11

M.Sc.

BIOCHEMISTRY

BCH - 170: Biomolecules

(2010 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to candidates:

- 1) Answer 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 acids with examples.
- b) Amino sugar with example and features.
- c) Rancidity.
- d) Explain term macromolecules. Enlist its types with example.
- e) Amphiphatic lipids. How do they behave in water.
- f) Classification of vitamins.

Q2) Answer any three of following.

[15]

- a) Write note on biochemical significance of coenzymes of vitamins.
- b) Write note on ionization of water.
- c) Explain significant chemical properties of carbohydrates.
- d) Give structural classification of lipids with examples.

P.T.O.

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

- a) Formation of macromolecules from their monomeric subunits.
- b) Phospholipids.
- c) Storage and structural polysaccharides.

SECTION - II

Q4) Explain the following (any 5). [15]

- a) Zwitter ion formation and properties.
- b) Non standard amino acids with examples.
- c) Significance of hydrogen bonding in stabilizing three dimensional structure of protein.
- d) Proteolysis and its significance.
- e) Draw structure of Histidine, Aspartate and praline.

Q5) Answer any three of following: [15]

- a) Explain features of tertiary structure of proteins.
- b) Write note on titration curve of glycine
- c) Give classification of amino acids.
- d) Explain β structure in detail.

Q6) Write note on any two of following. [10]

- a) Biochemical functions of protein.
- b) Edman's method for sequencing of proteins.
- c) Forces stabilizing three dimensional structure of protein.
- d) Ramchandran plot.



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SEAT No. :

P1492

[5224]-12

[Total No. of Pages : 3

M.Sc.-II

BIOCHEMISTRY

BCH - 171 : Enzymology & Physiological Biochemistry

Enzymology & Biophysical Techniques

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

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

SECTION-I

(Enzymology)

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

- a) Explain the mechanism of action of any one enzyme.
- b) How the rate of degradation (K_d) of the enzyme is measured?
- c) Define the terms i) apoenzyme ii) holoenzyme iii) allosteric site iv) cofactor v) multi-enzyme.
- d) What is positive co-operativity? Explain with suitable example.

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

- a) Write a note on zymogen activation.
- b) Comment on catalytic power and regulation of enzyme activity.
- c) Give the effect of competitive and non - competitive inhibitors on double reciprocal plot.
- d) Discuss in detail effect of substrate concentration on enzyme catalyzed reaction.

Q3) Attempt any two of the following. **[10]**

- a) Write a note on kinetics of enzyme turnover.
- b) How activity of any enzyme is controlled by covalent modification? Explain.
- c) What is specificity? Explain any three specificities with example.

P.T.O.

SECTION-II

(Physiological Biochemistry)

(2008 pattern)

Q4) Attempt 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 - III

(Biophysical Techniques)

(2010 Pattern)

Q4) Attempt any three of the following. **[15]**

- a) Describe the any one application of gel electrophoresis with example.
- b) Explain in detail the principle and technique of ion-exchange chromatography.
- c) Why it is necessary to purify enzyme? How enzymes are separated on the basis of their solubility?
- d) Explain the principle and application of isoelectric focusing.

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

- a) Write a note on SDS-PAGE.
- b) Explain how dialysis helps of purify proteins. Write a note on types of filtration.
- c) Describe any one application of UV-VIS spectrometer with example.
- d) How molecular weight of a protein can be determined by gel chromatography.

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

- a) Explain the principle and application of Hydroxyapatite Chromatography.
- b) How do you calculate the R_f values of separated amino acids in paper. Chromatography? Give its significance.
- c) Explain in detail the theory and working of HPTLC.



Total No. of Questions : 6]

SEAT No. :

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[5224]-13

[Total No. of Pages : 4

M.Sc.

BIOCHEMISTRY

BCH - 172 : Cell Biochemistry

(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

SECTION-I

(Cell Biochemistry - I)

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

- a) Explain principle & applications of phase contrast microscopy.
- b) What is meant by pure culture? Give methods for its preparation.
- c) Explain structure and arrangement of flagella.
- d) Explain pour plate method. Give its application and limitation.
- e) Discuss methods for preservation of bacterial culture.

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

- a) SEM
- b) Mycoplasma
- c) Endotoxins
- d) Lysogeny cycle of bacterial viruses

Q3) Write note on any two: [10]

- a) Freeze itching
- b) Peptidoglycan
- c) Gram staining

P.T.O.

SECTION-II

(Cell Biochemistry - II)

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

- a) Define cell cycle. Explain mitosis phases.
- b) Write a note on cell variability in size & shape.
- c) Distinguish between prokaryotic & eukaryotic cell.
- d) Give functions of plant cell wall.
- e) Explain organogenesis in brief.

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

- a) Elaborate structure of nucleus. Add note on its functions.
- b) Explain cell-cell adhesion.
- c) Write note on biological importance of fungi. Draw its cell structure.
- d) Explain structure and function of plasma membrane.

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

- a) Active & Passive transport
- b) Density gradient centrifugation
- c) Distinguish between xylem & phloem.



Total No. of Questions : 6]

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[5224]-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 the both sections should be written on separate answer sheets.*
- 2) All questions are compulsory.*
- 3) Figures to the right indicate full marks.*

SECTION-I

(Microbiology)

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

- a) What is mode of action of ethylene oxide.
- b) What are different chemical agents for control of micro-organism. Add note on action of alcohol.
- c) What are endotoxins? Explain with suitable examples.
- d) What are different methods for isolation of microorganism? Explain any one of them.
- e) Classify plant & animal viruses.

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

- a) Bacterial growth curve.
- b) Pour plate methods and its applications.
- c) Compare bright and dark field microscopy.
- d) Drug resistant mutants
- e) Replication of bacterial viruses

Q3) Write note on any two: [10]

- a) Differential staining
- b) Nitrogenase system
- c) Sterilization

SECTION-II

(Cell Biochemistry of Eukaryotes)

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

- a) Explain structure and function of plasma membrane.
- b) Describe cytoskeleton & its various components.
- c) Explain phases of mitosis.
- d) Write note on classification of cell on basis of cell variability in size & function.
- e) Explain cell-cell adhesion.

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

- a) Give classification of fungi and its biological importance.
- b) Define cell cycle. Elaborate on difference between mitosis and meiosis.
- c) Define gametogenesis. Distinguish between spermatogenesis and oogenesis.
- d) Explain ultra structure of chloroplast.

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

- a) Density gradient centrifugation
- b) Distinguishing features of xylem & phloem.
- c) Major groups of fungi.



Total No. of Questions :6]

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M.Sc.

BIOCHEMISTRY

BCH - 270: Bioenergetics and Metabolism

(2008 & 2010 Pattern) (Credit System) (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 and Metabolism I (2008 Pattern)

Bioenergetics and Metabolism I (2010 Pattern)

Q1) Answer any three of following.

[15]

- a) Explain first law of thermodynamics. Derive its equation form.
- b) Explain Glycolysis and its significance.
- c) Explain energetics and regulation of citric acid cycle.
- d) Describe Ketone bodies formation.

Q2) Answer any three of following.

[15]

- a) Explain amphibolic nature of TCA cycle.
- b) What is chemiosmotic hypothesis.
- c) Write note on electron transport chain.
- d) Explain bacterial photosynthesis.

P.T.O.

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

- a) Pentose phosphate pathway.
- b) Cyclic & Non cyclic phosphorylation.
- c) C_4 pathway.

SECTION - II

Metabolism II: Nitrogen Metabolism (2008 Pattern)

Bioenergetics & Metabolism - II (2010 Pattern)

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

- a) What is transamination of amino acids? Explain with example.
- b) Explain degradative pathway of pyrimidine nucleotide.
- c) How biosynthesis of threonine from aspartate is regulated.
- d) Give regulation mechanism of ribonucleotide reductase.

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

- a) What is fate of uric acid in different animal species.
- b) Write note on nonribosomal protein biosynthesis.
- c) Explain with example biosynthesis of aromatic amino acids.
- d) Give role and significance of nitrogenase system.

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

- a) Decarboxylation of amino acids.
- b) Gamma glutamyl cycle.
- c) Nitrogen cycle.



Total No. of Questions : 6]

SEAT No. :

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[5224]-22

[Total No. of Pages : 4

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) *Solve section I and section II on separate sheets.*

SECTION-I

(Biophysical Techniques - I)

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

- a) Differentiate between southern and northern blotting techniques. Give their application.
- b) Discuss the principle, procedure and application of gas liquid chromatography.
- c) How DNA fragments separated in agarose gel electrophoresis.
- d) Give the principle, working and application of NMR.
- e) Give the importance of freeze drying and lyophilization.

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

- a) Give the techniques & application of ion exchange chromatography.
- b) Give the principle and types of electrophoresis.
- c) Differentiate between stacking gel and separating gel. Give their significance.
- d) Give the significance of poly carbonate and nitrocellulose fiber.
- e) Give the difference between native and SDS-PAGE electrophoresis.

P.T.O.

Q3) Answer any two of the following. [10]

- a) Write the principle and application of dialysis.
- b) Describe the principle and procedure involved in separation of mixture of an acidic toxic and neutral aminoacids by ion-exchange chromatography.
- c) Why glycerol and bromophenol blue are mixed with sample that are loaded is Gel electrophoresis. Explain.

SECTION-II

(Biophysical Techniques - II)

Q4) Attempt any three of the following. [15]

- a) Write a note on density gradient centrifugation.
- b) What is meant by sensitization in autoradiography.
- c) Write a note on x-ray diffraction.
- d) Define sedimentation. Explain in detail construction and working of analytical ultra centrifugation.
- e) What are the applications of atomic absorption spectroscopy? Explain any two in brief.

Q5) Answer any three of the following. [15]

- a) What is quenching? List out the factors that are involved in quenching.
- b) Explain the methods for determination of molecular weight by sedimentation equilibrium method.
- c) Explain the diffusion, measurement and arrangement of subunits of haemoglobin.
- d) How partial specific volume and diffusion coefficient are corelated.
- e) Explain isotope tracer techniques and types of radiation.

Q6) Write short notes on any two. [10]

- a) Gamma Counter.
- b) Pycnometer.
- c) Meselson stall experiment.



Total No. of Questions : 6]

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[5224]-22

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 sheets.*

SECTION-I

(Biophysical Techniques)

Q1) 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 nucleotide bases of DNA?
- c) Distinguish between boundary and band sedimentation.
- d) How sensitivity of autoradiography is achieved.

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

- a) Diffusion measurement and arrangement of subunit of haemoglobin. Explain.
- b) What is the effect of addition of ethidium bromide on viscosity of DNA.
- c) How types of radiations are used in Biochemistry. Explain.
- d) Liquid scintillation counting.

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

- a) Meselson stahl experiment
- b) Effect of friction on sedimentation.
- c) Zimm Crother's Viscometer.

SECTION-II

(Structure Determination of Biomolecular)

Q4) Attempt any three of the following. **[15]**

- a) Give the principle and application of NMR spectrography.
- b) Explain on what trains biosemon are classified. Give its application.
- c) What is circular diachroism techniques? Explain its usefulness in structural determination of protein.
- d) Give the instrumentation of GLMS.
- e) What is polarization of fluorescence? List the basic rule for interpretation.

Q5) Answer any three the following. **[15]**

- a) Explain the special use of LCMs in biology and biochemistry.
- b) Give the principle and application of IR spectroscopy.
- c) Give the principle working and application of ESR.
- d) Explain the mechanism of glucose oxidase biosensor.
- e) What is the main difference between ORO & CD.

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

- a) Application of IR.
- b) Difference between NMR & ESR.
- c) Difference between GCMS and LCMS.



Total No. of Questions :6]

SEAT No. :

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[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH - 273 : Membrane biochemistry & Nucleic acids

BCH-273 : Membrane biochemistry & Genetics

(2008 & 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 right indicate full marks.*
- 4) *Draw neat labelled diagrams wherever necessary.*
- 5) *Answers 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) Explain various models of biological membrane.
- b) Write in detail drug transport through membrane.
- c) Write note on lipid interaction in a biological membrane.
- d) Describe structure and mechanism of Na⁺ k⁺ ATPase.

Q2) Answer any Three:

[15]

- a) Explain mechanism & role of gramicidin.
- b) Write note on glycosylation of membrane.
- c) Explain protein targetting in brief.
- d) What is diffusion? Add note on osmoregulation.

P.T.O.

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

- a) Bacterial toxins
- b) Gap junction
- c) Photo transferol system

SECTION - II

Nucleic Acids (2008 pattern)

Genetics (2010 pattern)

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

- a) Explain Meselson & Stahl experiment and its interpretation.
- b) Explain plasmids and their types in detail.
- c) Write note on chromosomal mutations.
- d) Explain Mendel's law of inheritance with example.

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

- a) Give detailed DNA double helix structure.
- b) What are auxotrophs. Explain method for isolation of auxotrophs
- c) Explain one-gene-one-cistron with example.
- d) Write note on lactose operon.

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

- a) Bacterial conjugation
- b) Semiconservative mechanism of DNA replication.
- c) Complementation test.



Total No. of Questions :4]

SEAT No. :

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M.Sc.

BIOCHEMISTRY

BCH -370: Molecular Biology

(2008 & 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 side indicate full marks.*

Q1) Answer any four of the following.

[20]

- a) Write note on types of DNA polymerases and their functional aspect.
- b) Explain types of point mutation.
- c) What is SOS response? Explain.
- d) Explain importance of EF-TU in E.coli during translation.
- e) Write note on semiconservative nature of DNA replication.

Q2) Attempt any two of the following.

[20]

- a) What is transposition? Give any two mechanisms.
- b) Explain editing of RNA in detail.
- c) Write note on Orazaki fragment.

Q3) Answer any four of the following:

[20]

- a) Justify prokaryotic transcription and translation are coupled.
- b) Explain mitochondrial protein transport.

P.T.O.

- c) Give steps involved in homologous recombination in which Rec A participation.
- d) Explain glycosylation of protein.
- e) How will you prove there are nicks in DNA? Explain.

Q4) Write short notes on (any four)

[20]

- a) Chromatin remodeling.
- b) Pyrimidine dimer formation its repair.
- c) Lysosomal protein transport.
- d) Clover leaf structure of t-RNA.
- e) E.coli RNA polymerase.



Total No. of Questions :6]

SEAT No. :

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[5224]-32

[Total No. of Pages : 3

M.Sc.

BIOCHEMISTRY

BCH - 371 : Medical Biochemistry and Immunology

(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 sheets.*

SECTION-I

(Medical Biochemistry)

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

- a) Give the structure and functions of lysosome in animal cell.
- b) Explain biochemistry of (CHD) coronary heart disease.
- c) Explain the mechanism of Apoptosis.
- d) Discuss the mode of transport of drugs in bacterial cell.
- e) Explain molecular genetics of cancer.

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

- a) Write a note on mycobacterium & enlist antibiotics used against it.
- b) Explain in detail extrinsic and intrinsic mechanism of apoptosis.
- c) Elaborate on puromycin and streptomycine.
- d) Explain the mode of action of antibiotics that inhibit the biosynthesis of cell wall with example.
- e) Write a note on thalassemia.

P.T.O.

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

- a) Interpret the presence of following enzymes in serum (i) LDH, (ii) Creatinine kinase.
- b) Explain molecular genetics of cancer.
- c) Define the term analgesics - Give their mechanism of action with suitable example.

SECTION-II

(Immunology)

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

- a) List out antigen- antibody reaction and explain any one in detail.
- b) Compare and contrast innate immunity and Humoral immunity.
- c) Explain how immunoelectrophoresis is more advantageous than immunodiffusion reaction.
- d) Give the appropriate meanings of following term with respect to antigens.
 - i) Antigenicity
 - ii) Hapten
 - iii) Specificity
 - iv) Complete antigen
 - v) Carrier
- e) Compare the complement activation events of the classical pathway with those of alternate pathway.

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

- a) Describe the structural features of Immunoglobulin 'G' and list out its functions.
- b) Describe types of MHC Molecules in detail.

- c) Explain Blood group substances.
- d) Give the principle, procedure and uses of Immunofluorescence.
- e) Describe structure of antibody with well labelled diagram.

Q6) Answer any two of the following:

[10]

- a) Western Blotting
- b) Ouchterlony and Rocket immuno electrophoresis.
- c) Immunodeficiency disease.



Total No. of Questions : 6]

SEAT No. :

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[5224]-33

[Total No. of Pages : 4

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 the two 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) Discuss the role of microfilaments and microtubules.
- b) Draw the structure of the typical nerve and explain the function of each organelle.
- c) Discuss the role of cGMP, phosphodiesterase and transducine in visual excitation.

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

- a) How does the absorption of light by the retinal Schiff base generate a signal?
- b) Describe in detail the molecular organization of thick and thin filaments.
- c) Explain the biochemical mechanism of hearing.
- d) Give a short account on the propagation of nerve impulse.

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

- a) Biochemistry of taste
- b) Chemotaxis
- c) Acetyl choline esterase
- d) Cardiac muscle contraction

P.T.O.

SECTION-II

(Signal Transduction Pathways - II)

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

- a) Describe in detail the chemical composition of the brain.
- b) Name the parts of CNS which constitute brain stem. What are the general functions of nervous system?
- c) Write a note on sensory perception.

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

- a) Describe the various factors affecting the development of CNS.
- b) What are the nuclear groups of hypothalamus and their main functions?
- c) Give an account on the structure and function of blood-brain barriers.
- d) Describe the steps involved in the generation of action potential.

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

- a) Cerebrospinal fluid
- b) Neurotransmitter Metabolism
- c) Sensory modalities
- d) Zinc fingers



Total No. of Questions : 4]

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[5224]-33

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 functions of CNS.
- b) Write a note on Cytology neuron.
- c) Explain the role of ion channels in generation of action potential.
- d) What are mechanically gated channels? Explain their role with example.
- e) Explain the fundamental differences between Chemically Gated and Voltage-Gated Channels?

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

- a) Describe the synthesis, storage and degradation of acetylcholine.
- b) Write a note on neuropeptides.
- c) Explain the biochemical mechanism of hearing.

Q3) Answer any two of the following: **[20]**

- a) Describe the roles of the cerebellum in the regulation of skilled movement.
- b) What are the molecular mechanisms by which Ca^{++} leads to transmitter release?
- c) Describe the ionic basis for inhibitory and excitatory post-synaptic potentials and how these changes can alter synaptic transmission.

Q4) Write a short notes on (any four)

[20]

- a) Brain and behaviour
- b) Short term memory
- c) Biochemistry of vision
- d) Blood-brain barrier
- e) Sensory circuits



Total No. of Questions : 4]

SEAT No. :

P1500

[Total No. of Pages : 2

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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 the right indicate full marks.*

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

- a) Explain forensic applications of toxicology.
- b) What are animal & plant toxins?
- c) Give overall impact of chlorinated insecticides on ecosystem.
- d) Explain pathogenesis of fatty liver. Give its clinical manifestations.
- e) Differentiate between venomous & poisonous animals.
- f) Explain detoxication and toxication reactions.

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

- a) Explain how teratogenic potential of chemical is evaluated?
- b) Write note on principle of toxicology.
- c) Give mechanism of animals developing tolerance against toxicants.
- d) Explain local and systemic toxicity.
- e) What are local toxic effects of organophosphorous insecticides?
- f) Explain cardiovascular effects of cadmium exposure.

P.T.O.

Q3) Answer any four of following :

[20]

- a) What are toxic effects of ozone and peroxyacetyl nitrate?
- b) What is fate of heavy metals in human body? Give special mention of lead.
- c) Explain Phase I & Phase II biotransformation reaction.
- d) Compare reversible and irreversible toxicity.
- e) Give factors effect occupational health.

Q4) Write notes on any four :

[20]

- a) Dose-response relationship.
- b) Xenobiotics metabolism.
- c) Effect of chlorinated insecticides on ecosystem.
- d) Carcinogenicity of arsenic.
- e) Classification of toxic agents.



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M.Sc.

BIOCHEMISTRY

BCH - 470: Biochemical Endocrinology and Tissue culture (2008 Pattern)

BCH - 470: 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) Explain the mechanism of action of hormone that acts via intracellular receptor.
- b) Explain the biochemical reaction involved in estrogen and progesterone synthesis.
- c) How secretion of insulin is regulated.
- d) Give the structural aspects of glycoprotein hormones.
- e) Describe the structural features and physiological functions of GH.

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

- a) Give the structural features & physiological functions of ACTH.
- b) What do you understand the terms Osteomalacia, primary and secondary aldosteronism?
- c) Explain how insulin affects the gene expressions?
- d) Which two enzymes are critical for catabolism and catecholamines? What is the metabolic product of the sequential action of these two enzymes?
- e) How secretion of thyroid hormone is regulated?

- Q3)** Write short note on any two **[10]**
- a) Role of calcium on release of catecholamine?
 - b) Effect of renin-angiotensin system on synthesis of adrenal steroid hormone.
 - c) Hormonal interrelationship.

SECTION - II

(Tissue Culture) (2008 Pattern)

- Q4)** Answer any three of the following. **[15]**
- a) Give advantages and disadvantages of natural media.
 - b) What is haploid culture. Give its applications with examples.
 - c) Give importance & limitation of organ culture.
 - d) Explain characteristics of transformed cells.
 - e) What is sterilization? Explain different methods involved.

- Q5)** Answer any three of the following. **[15]**
- a) Explain meaning and methods used in primary culture.
 - b) Discuss technique of micropropagation in detail.
 - c) What are somatic hybrids & cybrids. Give protoplast fusion technique.
 - d) Write note on cloning.
 - e) Explain various methods involved in animal tissue culture.

- Q6)** Write short notes on any two. **[10]**
- a) Secondary metabolites.
 - b) Animal cell preservation methods.
 - c) Transformed cells.
 - d) Agrobacterium mediated hairy root culture.

SECTION - II

(Plant Biochemistry) (2010 Pattern)

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

- a) What is role of secondary metabolites in plants with respect to flavonoids, lignins, pectin, terpenoids.
- b) Explain germination of seed and storage protein.
- c) Give role of phosphorus in plant growth.
- d) What is crop improvement? Explain role of plant breeding in it.
- e) What is micropropagation? Explain.

Q5) Explain the following (any 3) **[15]**

- a) Role of nitrogenase system and nitrate reductase in plant.
- b) Z- scheme of photosynthesis.
- c) CAM metabolism.
- d) Alkaloids.
- e) Oxygenase activity of Rubisco.

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

- a) Flavonoids.
- b) Cryopreservation.
- c) Somatic hybridization.



Total No. of Questions :4]

SEAT No. :

P1502

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[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH - 472 : Genetic Engineering
(2008 & 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 nucleases and topoisomerase.
- b) Write note on plasmids as vectors in genetic engineering.
- c) Write note on methods for selection of recombinant clones.
- d) Explain southern blotting.
- e) Explain role of reverse transcriptase enzyme.

Q2) Answer any four:

[20]

- a) What is meant by transgenic plants. Explain with example.
- b) Write note on microarray technology.
- c) Give applications of protein engineering.
- d) What is genomic library? Give method for its construction.

P.T.O.

Q3) Answer any four of the following

[20]

- a) Give method of blue white screening and its application.
- b) Explain PBR 322 in detail.
- c) Give applications of RFLP.
- d) What is colony hybridization?

Q4) Write note on any four of following.

[20]

- a) Ti plasmid
- b) PCR types
- c) Applications of genetic engineering in medicine.
- d) Methods of transfection.



Total No. of Questions : 6]

SEAT No. :

P1503

[5224]-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) Figures to the right indicate full marks.*
- 3) Answer 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) Batch culture.
- b) Agitation and Aeration.
- c) Effluent treatment.
- d) Methods for feedback control.
- e) Fermenter design.

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

- a) What are the different methods of preservation of obditionally important micro-organism.
- b) What are the different nitrogen source that are used in fermentation?
- c) What are different steps involved in sterilization?
- d) How product is recovered by chromatographic techniques.
- e) What is meant by media formulation.

P.T.O.

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

- a) Effect of inducer on fermentation.
- b) Development of inoculum for bacterial process.
- c) Instrumentation and control system in fermentation.

SECTION-II

(Food Technology)

Q4) Attempt any three of the following. **[15]**

- a) Monitoring of food quality is essential. Why?
- b) Differentiate the features of food obtained from plant source and animal source.
- c) What are genetically modified foods? Give their consequences.
- d) How will you manufacture natural and synthetic sweeteners.
- e) SCP are unconventional source of good proteins. Justify.

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

- a) Give the different method of starch production.
- b) What are the different enzymes used in fruit juice technology. Explain.
- c) Explain the different methods of food preservation.
- d) Discuss the role of enzymes in food processing with suitable example.
- e) Elaborate on various types of food additives.

Q6) Write short notes on any two. **[10]**

- a) Meat tenderisation.
- b) Flavouring agents in food industry.
- c) Primary feedstock and its importance.

