

Total No. of Questions : 8]

SEAT No. :

P1437

[5124]-101

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH - 170 : Biomolecules

(2013 Pattern) (Semester - I) (Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both sections should be written on separate answer sheets.*
- 2) *Q.4 and Q.8 are compulsory.*
- 3) *Attempt any two questions from Q.1 to Q.3 and any two from Q.5 to Q.7.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Q1) Answer the following:

- a) What are phospholipids? Explain with examples. [3]
- b) Explain general properties of carbohydrates. [3]
- c) Explain LDL and HDL with suitable example. [4]

Q2) Answer the following:

- a) What is rancidity? Explain. [2]
- b) Write an account on derivatives of sugars. [4]
- c) Describe formation of Miscelle and liposomes. [4]

Q3) Answer the following:

- a) What are vitamins? Explain their biological role. [3]
- b) Classify lipids with suitable example from each class. [5]
- c) What are chylomicrons? [2]

P.T.O.

Q4) Answer any one of the following: [5]

- a) What are carbohydrates? Classify with suitable example.
- b) Describe biological significance of lipids.

SECTION - II

Q5) Answer the following:

- a) Write note on rare amino acids. [3]
- b) Draw & explain different structural motifs in protein structure. [3]
- c) Explain different chemical properties of amino acids. [4]

Q6) Answer the following:

- a) Draw the structure of following tetrapeptide Asp-Gly-Val-Leu. [2]
- b) Write a short note on helical structure of protein. [4]
- c) Write a note on Globular proteins. [4]

Q7) Answer the following:

- a) Explain solid phase synthesis. [5]
- b) Peptide bond shows double bond character. Explain. Comment on features of peptide bond. [3]
- c) Define Zwitter ion. [2]

Q8) Answer any one of the following: [5]

- a) Write short note on Ramchandran plot.
- b) Explain end group analysis.



Total No. of Questions : 8]

SEAT No. :

P1438

[5124]-102

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH - 171: Enzymology and Biophysical Techniques
(2013 Pattern) (Credit System) (Semester - I)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both the sections should be written on separate sheets.*
- 2) *Question no. 4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q. 1 to Q. 3 and any two from Q. 5 to Q. 7.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

(Enzymology)

Q1) Answer the following:

- a) Give Michaelis-Menten equation and define each term. [2]
- b) What is the effect of change in temperature on enzyme catalyzed reaction. [4]
- c) Give the therapeutic significance of enzyme inhibitors. [4]

Q2) Attempt the following:

- a) Explain why ser-195 of chymotrypsin is super reactive. [3]
- b) What is substrate cycle? Explain with suitable example. [3]
- c) How pre-steady kinetics is studied? Explain its significance. [4]

Q3) Answer the following:

- a) Explain how a biochemist might discover that a certain enzyme is allosterically regulated. [2]
- b) What is ubiquitination? Explain the reactions. [3]
- c) Describe the various methods used for determination of active site. [5]

P.T.O.

Q4) Attempt any one of the following:

- a) Discuss the acid-base catalysis. [5]
- b) While determination of rate of degradation of enzyme how reutilization of precursor amino-acid is prevented? [5]

SECTION - II

(Biophysical Techniques)

Q5) Answer the following:

- a) What is a restriction map? [2]
- b) How are proteins eluted from affinity chromatography column? [4]
- c) What is hydroxyapatite chromatography? How it separate ss DNA from ds DNA? [4]

Q6) Attempt the following:

- a) Mention three unique advantages of size exclusion chromatography. [3]
- b) Explain any three factors which affect on absorption spectra of biomolecules. [3]
- c) Write a note on capillary electrophoresis. [4]

Q7) Answer the following:

- a) What is isocratic pump? Explain its use in chromatography. [2]
- b) Describe the applications of isoelectric focusing. [3]
- c) Write a note on DNA agarose gel electrophoresis. [5]

Q8) Answer any one of the following:

- a) Describe the principle and method of ion-exchange chromatography. [5]
- b) Describe the principle, method and significance of dialysis. [5]



Total No. of Questions : 8]

SEAT No. :

P1439

[5124]-103

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH - 172: Microbiology and Cell Biology
(2013 Pattern) (Credit System) (Semester - I)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both the sections should be written on separate answer sheets.*
- 2) *Question No. 4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q. 1 to Q. 3 and any two from Q. 5 to Q. 7.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

(Microbiology)

Q1) Answer the following:

- a) Give the methods for classification of micro-organism. [3]
- b) Explain phase contrast microscope in detail. [4]
- c) Explain the mode of action of phenol. [3]

Q2) Attempt the following:

- a) Write a note on nitrogen cycle. [2]
- b) Give the contribution of microbiologists towards vaccine development. [4]
- c) Explain the replication of Herpes simplex virus. [4]

Q3) Answer the following:

- a) How will you isolate bacterial mutants. [2]
- b) What is pure culture. How will you isolate pure culture. [5]
- c) Classify plant and animal viruses. [3]

P.T.O.

Q4) Answer any one of the following:

- a) Discuss the oxygen and temperature requirement for growth of bacteria. **[5]**
- b) Describe transmission electron microscopy and scanning electron microscopy. **[5]**

SECTION - II

(Cell Biology)

Q5) Answer the following:

- a) Write note on structure and function of nucleus. **[3]**
- b) Explain Active and Passive transport mechanisms. **[3]**
- c) Describe cytoskeleton and its various components. **[4]**

Q6) Answer the following:

- a) Describe structure and function of mitochondria in the cell. **[5]**
- b) Write note on marker enzymes of various cell organelles. **[3]**
- c) Define terms - chromosomes, sister chromatids and homologous chromosomes. **[2]**

Q7) Answer the following:

- a) Why meiosis is called reduced division? **[2]**
- b) Write a note on different types of transport mechanism across plasma membrane. **[5]**
- c) Write a note on cell-cell communication between plant cells. **[3]**

Q8) Answer any one:

- a) Define term gametogenesis. Differentiate between spermatogenesis and oogenesis. **[5]**

OR

- b) Write a note on cell function. **[5]**



Total No. of Questions : 8]

SEAT No. :

P1440

[5124]-201

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH-270 : Bioenergetics and Metabolism
(2013 Pattern) (Semester - II) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both the sections should be written on separate answer sheet.*
- 2) *Question No. 4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q.1 to Q.3 and any two from Q.5 to Q.7.*
- 4) *Figures to the right indicates full marks.*

SECTION-I

(Bioenergetics and Metabolism I)

Q1) Answer the following:

- a) What do you mean by metabolism. [2]
- b) Draw the structure of ATP and list out its significance. [3]
- c) Discuss beta oxidation of even number carbon atom. [5]

Q2) Attempt the following:

- a) Define gluconeogenesis. [2]
- b) What are uncouplers? How do they effect ETC and ATP synthesis. [5]
- c) Give the biosynthesis of triglycerides [3]

Q3) Answer the following:

- a) List out irreversible reaction in glycolysis. [2]
- b) What is free energy, enthalpy and entropy. [3]
- c) Although O₂ is not involved in any step of TCA cycle yet the cycle in aerobic. Explain. [5]

Q4) Answer any one of the following:

- a) Give the significance of glyoxalate pathway. [5]
- b) Discuss the role of electron carriers in mitochondrial respiration. [5]

P.T.O.

SECTION-II
(Metabolism)

Q5) Answer the following:

- a) Explain biosynthesis of cysteine, methionine & threonine. [3]
- b) Give the function of precursor in amino acid biosynthesis [4]
- c) Explain Gout in detail. [3]

Q6) Answer the following:

- a) Write in short role of folic acid in amino acid metabolism. [2]
- b) Explain gamma glutamyl cycle. [4]
- c) Write note on pyrimidine nucleotide biosynthesis. [4]

Q7) Answer the following:

- a) What is transamination? [2]
- b) What is phenolketone urea. Explain its causes and symptoms in detail. [5]
- c) Write note on urea cycle regulation. [3]

Q8) Answer any one of the following:

- a) Purine degradation [5]
- b) Discuss formation of aromatic amino acids. [5]



Total No. of Questions : 8]

SEAT No. :

P1441

[5124]-202

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH-271: Techniques in Characterization of Biomolecules
(2013 Pattern) (Semester - II) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both sections should be written on separate answer sheet.*
- 2) *Question No.4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q.1 to Q.3 and any two from Q.5 to Q.7*
- 4) *Figures to the right indicate full marks.*

SECTION - I

(Biophysical Methods)

Q1) Answer the following:

- a) What is Viscosity. [2]
- b) Give the application of atomic Absorption Spectrophotometer. [4]
- c) Give the different methods used for measurement of concⁿ in an analytical centrifuge cell. [4]

Q2) Attempt the following :

- a) Give the principle of liquid scintillation counter. [2]
- b) What are the different methods used for measurement of viscosity of the solution. [4]
- c) Describe the application of α -ray diffraction. [4]

Q3) Answer the following:

- a) Describe the stripping film method of auto radiography. [3]
- b) Write a note on isotope tracer technique. [3]
- c) What is sedimentation velocity. Describe the factor affecting it. [4]

Q4) Answer any one of the following:

- a) What is radioactivity ? How will you measure it. Explain. [5]
- b) Distinguish between boundary and band sedimentation.

P.T.O.

SECTION-II

(Structure Determination of Biomolecules)

Q5) Answer the following:

- a) What are Biosensors? Explain. [3]
- b) What is NMR? Give the principle. [3]
- c) Distinguish between ORD and CD. [4]

Q6) Attempt the following:

- a) What is meant by fluorescence. [2]
- b) Explain the principle, working and application of LCMS. [5]
- c) Write a note on various matrix used in MALDI. [3]

Q7) Answer the following:

- a) Discuss cell based biosensors. [3]
- b) Explain the superiority of MALDI-TOF-MS than MALDI. [5]
- c) Give the application of GCMS. [2]

Q8) Answer any one of the following: [5]

- a) What is fluorescence depolarization. Explain the experiment for measuring the polarization of fluorescence.
- b) How the fluidity of the interior part of erythrocyte membrane is studied with the help of ESR spectroscopy.



Total No. of Questions : 8]

SEAT No :

P1442

[5124]-203

[Total No. of Pages :3

M.Sc.

BIOCHEMISTRY

**BCH-272 : Biostatistics, Computer and Bioinformatics
(2013 Pattern) (Credit System) (Semester-II)**

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Answer to both the sections should be written on separate answer sheet.*
- 2) *Question no. 4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q.1 to Q.3 and any two from Q.5 to Q.7.*
- 4) *Figures to the right indicate full marks.*
- 5) *Supplementary will be provided for checking p-values.*
- 6) *Graph papers will be provided.*

SECTION-I

(Biostatistics and Computers)

Q1) Answer the following:

- a) Give importance of biostatistics in life science. [2]
- b) Explain binary and decimal numbers. [3]
- c) Find the cumulative and relative frequencies of the following data. [5]

No.of pods	1-9	10-20	21-30	31-40	41-50
No.of plants	4	6	25	15	20

Q2) Attempt the following:

- a) Calculate the mean of the following data. [2]

10	13	14	9	10
----	----	----	---	----

- b) Calculate the standard deviation and standard error of data. [4]

Waxy plants	15	17	7	9	11
No.of plants	18	12	18	15	14

- c) Calculate the value of median and also determine it graphically using Ogive. [4]

Variable	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	6	8	10	12	14	15

P.T.O.

Q3) Answer the following:

- a) The following data represents the number of productive tillers per plant of a wheat variety .

Draw a histogram of the following data [3]

No.of plants	0-4	4-8	8-12	12-16	16-20	20-24
No.of productive tillers	10	11	12	15	20	12

- b) Data on hair colour and the eye colour are given in the table. Calculate the chi-square value. Determine the association between the hair colour and the eye colour. [5]

		Fair	Brown	Black	Total
Eye colour	Blue	15	20	5	40
	Grey	20	20	10	50
	Brown	25	20	15	60
	Total	60	60	30	150

- c) What do you mean by flowchart. Give its uses. [2]

Q4) Answer any one of the following: [5]

- a) Explain the programming in BASIC.
b) Explain input, output and format statements.

SECTION-II
(Bioinformatics)

Q5) Answer the following:

- a) Write a note on PAM matrices. [2]
b) Explain nucleotide sequence database. [3]
c) Explain and distinguish between global and local alignment. [5]

Q6) Attempt the following:

- a) Explain multiple sequence alignment. [2]
b) Explain Needleman and Wunsch algorithm. [5]
c) Explain Pub Med central. [3]

Q7) Answer the following:

- a) What do you mean by Hamming Distance. [2]
- b) What is Smith-Waterman algorithm. Explain. [5]
- c) State the salient features of any protein 3D structure visualization software. [3]

Q8) Answer any one of the following: [5]

- a) Explain how sequence data is generated for expressed sequence tags database division of NCBI.
- b) Explain why there is need of Heuristics approach in database sequence search. Explain any one heuristics approach in sequence similarity search.



Total No. of Questions : 8]

SEAT No. :

P1443

[5124]-204

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH - 273:Membrane Biochemistry & Genetics
(2013 Pattern) (Credit System) (Semester - II)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answers to both sections should be written on separate answer sheets.*
- 2) *Question No.4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q1 to Q3 and any two from Q5 to Q7.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

(Membrane Biochemistry)

Q1) Answer the following:

- a) Explain nuclear pore complex. [3]
- b) Give an account of membrane transport mechanism. [3]
- c) Describe the mechanism of Na-K pump and comment on its functions. [4]

Q2) Attempt the following :

- a) Give an example of membrane asymmetry. [2]
- b) What are ionophores? Explain with example. [3]
- c) Explain Gap function and its significance. [5]

Q3) Answer the following:

- a) What are antimicrobial agents, give their role. [2]
- b) Explain lipids as a major constituent of biological membranes. [4]
- c) Give an account on factors affecting physical properties of membrane. [4]

P.T.O.

- Q4)** Attempt any one of the following : [5]
- a) Sodium channel and its significance.
 - b) Give difference between primary and secondary active transport.

SECTION - II

(Genetics)

- Q5)** Answer the following :
- a) Explain co-dominance and incomplete dominance with suitable examples. [3]
 - b) Give in detail applications of pedigree analysis. [3]
 - c) Genetic code is degenerate explain. [4]

- Q6)** Answer the following:
- a) What are plasmids, enlist different types. [3]
 - b) What do you understand by Denaturation and renaturation of DNA. [3]
 - c) Explain steps involved in bacteriophage life cycle. [4]

- Q7)** Answer the following:
- a) Write note on Tetrad analysis. [3]
 - b) Give an account on regulation of lactose operon. [3]
 - c) State and explain law of segregation with example. [4]

- Q8)** Explain any one in detail. [5]
- a) Define Dosage compensation, explain mechanism of dosage compensation in humans.
 - b) Write note on chromosomal mutations.



Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages : 2

P1444

[5124]-301

M.Sc. (Part - II)

BIOCHEMISTRY

BCH - 370 : Molecular Biology

(2013 Pattern) (Semester - III) (Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right side indicate full marks.*
- 3) *Solve any three questions from Q.1 to Q.4.*
- 4) *Question 5 and 6 are compulsory.*

Q1) Answer the following:

- a) What are ribozymes? [2]
- b) Write a note on prokaryotic RNA polymerase. [3]
- c) Explain mobile genetic elements with an example. [2]
- d) Explain Rho-dependent transcription termination process. [3]

Q2) Answer the following:

- a) Explain Holiday junction model. [3]
- b) Give the role of helicase and ligase in DNA replication. [3]
- c) Proteins are modified before targeting or transportation. Explain. [4]

Q3) Answer the following:

- a) Explain pyrimidine dimer formation. [3]
- b) Explain role of t-RNA in translation. [3]
- c) Explain steps in homologous recombination in which Rec A participates. [4]

P.T.O.

Q4) Answer the following:

- a) What are adenovirus? [2]
- b) Write a note on Initiation of transcription in prokaryotes. [3]
- c) What is 5' capping and 3' tailing. [2]
- d) Define role of helicase in DNA replication. [3]

Q5) Attempt any two:

- a) Explain Eukaryotic transcription process. [5]
- b) Give the post translational modification of m-RNA. [5]
- c) Explain retrotransposons and their method of transposition. [5]

Q6) Attempt any two:

- a) Explain the need for post transcriptional modifications. [5]
- b) Explain chromatin remodeling. [5]
- c) Explain the mitochondrial transportation of protein. [5]



Total No. of Questions : 8]

SEAT No. :

P1445

[5124]-302

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH - 371: Medical Biochemistry and Immunology
(2013 Pattern) (Credit System) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 50

Instruction to the candidates:

- 1) Answer any 2 question from Question No. 1-3 and 5-7.
- 2) Question No. 4 and 8 are compulsory.
- 3) Answer to each section are written to be on separate answer sheets.

SECTION - I

Medical Biochemistry

Q1) Answer the following.

- a) Define drugs and antibiotics. [2]
- b) What is role of viruses in carcinogenesis. [4]
- c) Give the pathophysiology of nickel and anemia. [4]

Q2) Answer the following:

- a) Give any two basic approach by WHO for control of cancer. [2]
- b) Describe any one mechanism of resistance to antibiotics. [5]
- c) Describe molecular basis of hemoglobinopathies. [3]

Q3) Attempt the following:

- a) Give the structure and function of lysosome in animal cell. [5]
- b) Explain extrinsic apoptosis. [2]
- c) Write a note on mycobacterium. [3]

P.T.O.

Q4) Answer any one of the following:

- a) Explain role of viruses as carcinogen in causing cancer. [5]
- b) Give the composition of CSF and their biochemical significance. [5]

SECTION - II

Immunology

Q5) Answer the following:

- a) Explain Rochet immuno electrophoresis. [2]
- b) Explain inivate immunity in detail. [4]
- c) Explain types of Immunoglobulin classes. [4]

Q6) Attempt the following:

- a) Give the developmental stages of T cells. [3]
- b) Explain the role of different cells involved in cell mediated immunity.[3]
- c) How do vaccine work? Why do we cannot have vaccine for each and every disease. [4]

Q7) Answer the following:

- a) What are interferom? Explain its role. [3]
- b) Write a note on blood group substances. [3]
- c) Give the production of monoclonal Abs. [4]

Q8) Answer any one of the following.

- a) List out the types of hyper sensitivity reaction and give their features.[5]
- b) What are Immuno deficiency diseases? Discuss the features of one such disease. [5]



Total No. of Questions : 8]

SEAT No. :

P1446

[5124]-303

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH - 372: Neurochemistry and Biochemistry of specialized Tissues
(Credit System) (Semester - III) (2013 Pattern)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answers to both the sections should be written on separate answer sheets.*
- 2) *Question no. 4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q. 1 to Q. 3 and any two from Q. 5 to Q. 7.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Neurochemistry

Q1) Answer the following:

- a) What is neuroplasm? [2]
- b) Explain the difference between short term and long term potentiation. [4]
- c) What are diverging and converging circuits. [4]

Q2) Attempt the following:

- a) Describe the functional parts of the nerve cell. [3]
- b) What are the types of synapses? Explain any one with example. [3]
- c) How do the autonomic nervous system and somatic nervous system compare in the structure and functions? [4]

Q3) Answer the following:

- a) What is the composition of nervous tissue? [4]
- b) Explain the role of acetylcholine. [3]
- c) Write a note on circadian rhythms. [3]

P.T.O.

Q4) Attempt any one of the following: [5]

- a) Write a note on cerebrospinal fluid.
- b) What are neuropeptides. Explain the mechanism of action of neuropeptide with an example.

SECTION - II

Biochemistry of specialized Tissues

Q5) Answer the following:

- a) What is graded potential? [2]
- b) Explain the structure and function of rhodopsin. [4]
- c) Describe the biochemistry of smell. [4]

Q6) Attempt the following:

- a) What is selectivity and specificity of channels? Explain with example. [3]
- b) Explain the mechanism and function of hair cells of cochlea. [3]
- c) Describe the role of dynein. [4]

Q7) Answer the following:

- a) What is dynamic instability? [2]
- b) Write a note on colour vision. [3]
- c) Describe the mechanism of muscle contraction. [5]

Q8) Answer any one of the following: [5]

- a) Write a note on primary events in visual excitation.
- b) Describe the signal transduction system of chemotaxis.



Total No. of Questions : 8]

SEAT No. :

P1447

[5124]-304

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH - 373 : Toxicology and Plant Biochemistry
(2013 Pattern) (Semester - III) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both the section should be written in different answer sheets.*
- 2) *Solve any two questions from Q.1 to Q.3 and any two question from Q.5 to Q.7.*
- 3) *Question No. 4 and Q.No.8 are compulsory.*
- 4) *Figures to right indicate full marks.*

SECTION - I

Toxicology

Q1) Answer the following:

- a) What are animal and plant toxins. [2]
- b) Explain reversible and irreversible toxicity. [4]
- c) Give the mechanism of phase I and phase II reaction. [4]

Q2) Attempt the following.

- a) Explain mutagenicity with reference to toxicity. [3]
- b) Explain detoxication and toxication reaction. [4]
- c) Explain the role of industrial solvents & vapours. [3]

Q3) Answer the following.

- a) Write a note on organophosphorus. [2]
- b) Explain the forensic and clinical application. [4]
- c) Explain the component of cytochrome P-450 mono oxygenase system. [4]

P.T.O.

Q4) Attempt any one of the following.

- a) How will you evaluate the toxicity of a substance. [5]
- b) Write the difference between acute, subacute subchronic and chronic toxicity. [5]

SECTION - II

Q5) Attempt the following.

- a) Describe the structure of chloroplast with neat labelled diagram. [3]
- b) What are secondary metabolites? Explain the chemistry and role of alkaloids. [4]
- c) Write note on seed dormancy. [3]

Q6) Attempt the following.

- a) Write an account of various plant pests and the symptoms of infection. [3]
- b) Give role of magnesium in plant growth. [3]
- c) Write a note on sulphur metabolism. [4]

Q7) Attempt the following.

- a) Describe the physiology of seed germination in plant. [3]
- b) Enlist the microelements required for plants and the role of any two of them. [2]
- c) Describe the light reaction of photosynthesis. [5]

Q8) a) Give a detailed account of N_2 fixation and assimilation. [5]

OR

- b) Describe the types and role of plant hormones in growth and development. [5]

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Total No. of Questions : 8]

SEAT No :

P1448

[5124]-401

[Total No. of Pages :2

M.Sc.

BIOCHEMISTRY

**BCH-470 : Physiological Biochemistry & Endocrinology
(2013 Pattern) (Credit System) (Semester-IV)**

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Answer to both the sections should be written on separate sheets.*
- 2) *Question no. 4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q.1 to Q.3 and any two from Q.5 to Q.7.*
- 4) *Figures to the right indicate full marks.*

SECTION-I

(Physiological Biochemistry)

Q1) Answer the following:

- a) Write the anatomy of the kidney. [3]
- b) Explain any three physiological functions of liver. [3]
- c) What are the digestive functions of the components of pancreatic juice?[4]

Q2) Attempt the following:

- a) Where is the juxtaglomerular apparatus located and what is its structure?[2]
- b) Describe the functions of the respiratory system. [4]
- c) What factors affect the rate of diffusion of oxygen and carbon dioxide?[4]

Q3) Answer the following:

- a) What are the characteristics of normal urine? [2]
- b) How is the secretion of saliva regulated? [3]
- c) What is the importance of mucous neck cells, chief cells, parietal cells and G-cells in the stomach. [5]

P.T.O.

Q4) Attempt any one of the following:

- a) Why do infants experience greater problems with fluid electrolyte and acid-base balance than adults? [5]
- b) What is the difference between digestion and absorption? How are the end products of carbohydrates, proteins and lipid digestion absorbed? [5]

SECTION-II

(Endocrinology)

Q5) Answer the following:

- a) Give the main difference between group-I and group-II class of hormones. [2]
- b) What are prostaglandins? Describe their functions. [4]
- c) Write a note on hormone-response unit. [4]

Q6) Attempt the following:

- a) What is the significance of organification in thyroid hormone synthesis. [3]
- b) Explain the phenomenon of target cell insensitivity. [3]
- c) What are G-protein coupled receptors? Describe the role in the mode of action of hormone. [4]

Q7) Answer the following:

- a) How are diabetes mellitus and diabetes insipidus different? [2]
- b) What is the significance of altering kinase activity of target cells? [3]
- c) Explain the major action of aldosterone on target cell. [5]

Q8) Attempt any one of the following:

- a) Describe the classification of hormones based on mode of action. [5]
- b) Explain the role of angiotensin II and III in the regulation of mineralocorticoid. [5]



Total No. of Questions : 8]

SEAT No. :

P1449

[5124]-402

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

**BCH:471: Fermentation Technology and Tissue Culture
(2013 Pattern) (Semester - IV) (Credit System)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answer to both the sections should be written on separate answer sheet.*
- 2) Question No:4 and 8 are compulsory.*
- 3) Attempt any two questions from Q.1 to Q.3 and any two from Q.5 to Q.7*
- 4) Figures to the right indicate full marks.*

SECTION - I

Fermentation Technology

Q1) Answer the following:

- a) What do you mean by aeration and agitation. [2]
- b) What are the different criteria for isolation of industrially important microorganism. [4]
- c) What are the basic requirement for expression of foreign DNA in micro-organism. [4]

Q2) Attempt the following :

- a) List out the technique used for effluent treatment. [2]
- b) Give any one application of fermentation technology. [4]
- c) Explain media optimization in detail. [4]

Q3) Answer the following:

- a) Enlist the different sterilization technique. [2]
- b) Give the techniques for isolation of auxotrophic mutants. [4]
- c) Give the different methods for strain improvement. [4]

Q4) Attempt any one of the following: [5]

- a) How will you choose a recovery process during fermentation.
- b) Explain fermentor design.

P.T.O.

SECTION-II

Tissue culture

Q5) Answer the following:

- a) Enlist any two growth regulator with their functions. [3]
- b) What are micro-nutrients? Enlist micro-nutrients present in MS-media. [3]
- c) Give the principle, working and application of CO₂ incubator. [4]

Q6) Attempt the following:

- a) Give the steps to obtain primary culture. [3]
- b) Describe various physical and chemical agents used for sterilization. [3]
- c) How haploid can be produced in tissue culture. [4]

Q7) Answer the following:

- a) How to establish protoplast culture. [3]
- b) What is somatic embryogenesis? Add a note on factors affecting it. [3]
- c) Give an account of organ culture in detail with suitable example. [4]

Q8) Answer any one of the following:

- a) What is Micropropagation? Explain different stages of micropropagation. [5]
- b) What are serum free media? Discuss the advantages and disadvantages of such media. [5]



Total No. of Questions : 8]

SEAT No. :

P1450

[5124]-403

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH:472:Genetic Engineering

(2013 Pattern) (Credit System) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat labelled diagrams must be drawn wherever necessary.*
- 2) *Solve section I and II on separate answer books.*
- 3) *Solve any two questions from Q1 to Q3 and any two from Q5 to Q7. Question 4 and 8 are compulsory.*
- 4) *Figures to right indicate full marks.*

SECTION - I

Q1) Answer the following:

- a) Give two restriction enzymes and their recognition site. [2]
- b) Write note on blue white screening. [4]
- c) Give methods for identification of transformed and non-transformed cells. [4]

Q2) Answer the following :

- a) What are probes? [2]
- b) Write note on Ti-plasmid and discuss T-DNA organization. [4]
- c) Explain colony hybridization. [4]

Q3) Answer the following:

- a) What are cosmids? [2]
- b) Write note on pyrosequencing. [4]
- c) What are reporter gene? Discuss about types of reporter genes. [4]

Q4) Explain in detail:

- a) Write note on pBR322 Plasmid vector. [5]

OR

- b) How cDNA library is constructed and how it differs from genomic library. [5]

P.T.O.

SECTION - II

Q5) Answer the following :

- a) What are transcriptome? [2]
- b) Write note on applications of PCR. [4]
- c) Explain herbicide resistance with suitable example. [4]

Q6) Answer the following:

- a) Give two examples of any two pest resistant plants produced using genetic engineering. [2]
- b) Describe the embryonic cell transfer technology with its applications. [4]
- c) Explain colony hybridization. [4]

Q7) Answer the following:

- a) What is si RNA. [2]
- b) Write short on genome annotation technique. [4]
- c) Describe production of recombinant proteins in E. coli [4]

Q8) Explain in detail:

- a) What is in-vitro mutagenesis? Describe oligonucleotide based method of introducing mutation. [5]

OR

- b) Describe the different methods of gene transfer in plants. [5]



Total No. of Questions : 8]

SEAT No :

P1451

[5124]-404

[Total No. of Pages :2

M.Sc.

BIOCHEMISTRY

**BCH-473 : Clinical Nutrition and Food Technology
(2013 Pattern) (Credit System) (Semester-IV) (Optional)**

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Answer to both the sections should be written on separate answer sheet.*
- 2) *Question no. 4 and 8 are compulsory.*
- 3) *Attempt any two questions from Q.1 to Q.3 and any two questions from Q.5 to Q.7.*
- 4) *Figures to the right indicate full marks.*

SECTION-I

(Clinical Nutrition)

Q1) Answer the following:

- a) Give the importance of Dietary fiber. [2]
- b) Which toxic chemicals are present in tea? Explain the effect in brief. [4]
- c) Write a note on tobacco. [4]

Q2) Attempt the following:

- a) What do you mean by malnutrition. [2]
- b) Give the adverse effect of alcohol and tea. [4]
- c) Explain the factor affecting digestion and absorption of food. [4]

Q3) Answer the following:

- a) Define neutral tranquilizers. [2]
- b) Explain amino acid therapy. [4]
- c) Give the nutritional management of in born error. [4]

P.T.O.

- Q4)** Answer any one of the following: [5]
- a) How will you co-relate malnutrition with mental development and infection.
 - b) Give the effect of acidic and alkaline food on nutritional status of human being.

SECTION-II
(Food Technology)

Q5) Answer the following:

- a) Explain primary feedstock. [2]
- b) Give the biochemistry of food spoilage. [4]
- c) Write a note on any food additive used in food industry. [4]

Q6) Answer the following:

- a) Differentiate the features of food obtained from plant and animal origin. [3]
- b) Give the methods and explain the manufacturing process of natural and synthetic sweetness. [5]
- c) Explain the role of enzymes in food industries. [2]

Q7) Attempt the following:

- a) Give the difference between natural and synthetic syrups. [2]
- b) Write a note on proteins obtained from unconventional sources. [4]
- c) Describe the enzymes used for food analysis for toxin and alcohol. [4]

Q8) Answer any one of the following: [5]

- a) Explain the different methods for starch production.
- b) Explain genetically modified food in detail.

