

Total No. of Questions :8]

SEAT No. :

P2217

[4824]-101

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH-170: Biomolecules

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Question No.4 and 8 are compulsory. Out of the remaining attempt 2 questions from section I and 2 questions from section II.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right side indicate full marks.*
- 5) *All questions carry equal marks.*

SECTION-I

Q1) Answer the following.

- a) Draw the structures of following [3]
 - i) Fructose
 - ii) Maltose
 - iii) Cellulose
- b) Explain role of vitamins as co-enzyme. [3]
- c) Write note on miscelle formation in lipids. [4]

Q2) Answer the following:

- a) What are epimers? [2]
- b) Write any three chemical reactions of carbohydrates. [3]
- c) Explain properties of water in detail. [5]

Q3) Attempt the following.

- a) What are chylomicrons? [2]
- b) Give role of vitamins in deficiency conditions. [4]
- c) Explain biological significance of carbohydrates. [4]

P.T.O.

Q4) Answer any one of following.

- a) Classify carbohydrates with one example of each class. [5]
- b) Give the characteristics and features of fat soluble vitamins. [5]

SECTION-II

Q5) Attempt the following.

- a) Give the levels of protein conformation with one example of each. [3]
- b) Name any three rare amino acids with their significance. [3]
- c) Explain the β -structure of proteins. [4]

Q6) Answer the following.

- a) Enlist the forces that stabilize protein structure. [2]
- b) Explain any two super-secondary structures of proteins with diagrams and their significance. [4]
- c) Draw structure of haemoglobin and explain its significance. [4]

Q7) Answer the following:

- a) Draw structure of Proline, Histidine, Asparagine, Cystine. [2]
- b) Give the significance of α -helix and β -helix. [3]
- c) What is Ramchandran plot. Explain in detail. [5]

Q8) Attempt any one of following:

- a) What is protein sequencing? Explain any one method of sequencing in detail. [5]
- b) Discuss the properties and classification of aminoacids. [5]



Total No. of Questions :8]

SEAT No. :

P2218

[4824]-102

[Total No. of Pages :3

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) Answers to both the sections should be written in separate answer sheets.*
- 2) Questions 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) What is the chemical basis of enzyme specificity? [2]
- b) With suitable example explain zymogen and its activation. [4]
- c) Give significance of allosteric and co-operative behavior of enzymes.[4]

Q2) Attempt the following:

- a) What are co-enzymes? Give the co-enzyme form of thiamin and niacin.[3]
- b) Explain competitive inhibition with example. [3]
- c) Give the salient features of active site of enzymes. [4]

P.T.O.

Q3) Answer the following:

- a) State Michellis Menten equation and give its significance. [2]
- b) Describe Hill equation. [3]
- c) Discuss the use of X-ray crystallography technique in study of enzyme mechanism. [5]

Q4) Attempt any one of the following:

- a) Describe the mechanism of reaction catalysed by chymotrypsin. [5]
- b) Explain detail classification of enzymes with suitable examples of each class. [5]

SECTION -II

Biophysical Techniques

Q5) Answer the following:

- a) What is uv and visible range? Give significance. [2]
- b) Enlist various methods of protein Isolation and explain any one. [4]
- c) Explain principle at 2-D gel electrophoresis. [4]

Q6) Attempt the following:

- a) Describe the term resolution, partition coefficient and selectivity factor in chromatography. [3]
- b) Give principle and applications of dialysis. [3]
- c) What are different components of spectrophotometer? Give two application of uv visible spectroscopy. [4]

Q7) Answer the following:

- a) What is theoretical plate? [2]
- b) Give the principle of Agarose gel electrophoresis. [3]
- c) What is affinity chromatography? Explain principle of metal chelate chromatography. [5]

Q8) Attempt any one of the following:

- a) What are cation & anion exchangers? How ion exchange chromatography is used in protein purification? [5]
- b) What is electrophoresis? With examples explain continuous & discontinuous electrophoresis. [5]

EEE

Total No. of Questions : 8]

SEAT No. :

P2219

[4824]-103

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer any two questions from question No. 1-3 and any 2 questions from question No.5-7.*
- 2) *Q.No. 4 and 8 are compulsory.*
- 3) *Answer both the sections on separate answer sheets.*

SECTION - I

(Microbiology)

Q1) Answer the following:

- a) Classify plant and animal viruses. [2]
- b) Explain bacterial growth curve. [4]
- c) Discuss industrial production of alcohol. [4]

Q2) Attempt the following:

- a) What are the methods for classification of microbes. [2]
- b) Explain in detail electron microscope for studying micro-organism with its limitation. [4]
- c) Write a note on exotoxin and endotoxin. [4]

Q3) Answer the following:

- a) Explain the replication of Herpes simplex virus. [5]
- b) Explain pour plate technique. [3]
- c) What do you mean by nitrogen fixation. [2]

P.T.O.

Q4) Attempt any one of the following:

- a) Give the methods for isolation of bacterial mutants. [5]
- b) Explain physical and chemical agents in control of micro - organisms. [5]

SECTION - II

(Cell Biology)

Q5) Answer the following:

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

Q6) Attempt the following:

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

Q7) Answer the following:

- a) Why meiosis is called reduction 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 of the following:

- a) Define the term gametogenesis. Differentiate between spermatogenesis and oogenesis. [5]
- b) Write a note on cell junction. [5]



Total No. of Questions : 8]

SEAT No. :

P2220

[4824]-201

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

SECTION-I

Q1) Attempt the following:

- a) Discuss the interconversion of hexoses. **[4]**
- b) Describe the mechanism of action of pyruvate dehydrogenase complex. **[3]**
- c) Discuss in short oxidation-reduction reactions in TCA cycle. **[3]**

Q2) Attempt the following:

- a) Give a short account on energy rich compounds. **[4]**
- b) Discuss in short Glyoxylate pathway. **[3]**
- c) Explain transaldolase and transketolase. **[3]**

Q3) Attempt the following:

- a) Explain Pasteur effect. **[3]**
- b) What is principle of chemoosmotic hypothesis? **[3]**
- c) Write note on pyruvate dehydrogenase complex. **[4]**

P.T.O.

Q4) Attempt Any One of the following:

- a) Explain breakdown of glucose to pyruvate add a note on its energetics. [5]
- b) Explain in detail β -oxidation of even number of carbon atom fatty acids. [5]

SECTION-II

Q5) Attempt the following:

- a) What is fate of uric acid in different animal species. [3]
- b) Explain synthesis of purine nucleotides. [4]
- c) Write note on polyamines. [3]

Q6) Attempt the following:

- a) What are causes of Albinism? [3]
- b) How purine nucleotide biosynthesis is regulated. [3]
- c) Explain role of PRPP in purine nucleotide synthesis. [4]

Q7) Attempt the following:

- a) Write note on synthesis of methionine. [4]
- b) What is salvage pathway of purines? [3]
- c) Draw diagram to show contribution of all carbon and hydrogen atoms in purine nucleus. [3]

Q8) Attempt Any One:

- a) Describe purine synthesis and regulation. [5]
- b) Explain urea cycle. [5]



Total No. of Questions :8]

SEAT No. :

P2221

[4824]-202

[Total No. of Pages :3

M.Sc.

BIOCHEMISTRY

BCH - 271: Techniques for Characterization of Biomolecules

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

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) Answers to both sections should be writtem in separate answer sheets.*
- 2) Questions no. 4 and 8 are compulsory.*
- 3) Attempt any two questions from Q.1 to Q.3 and 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 the principal of zonal centrifugation. [2]
- b) Describe the use of X-ray diffraction technique in biochemistry. [4]
- c) What is GM counter? Explain the applications in brief. [4]

Q2) Attempt the following:

- a) Describe the stripping film method used for autoradiography. [3]
- b) What is boundary sedimentation? What are its applications. [3]
- c) Explain the working principle of analytical ultracentrifugation. [4]

P.T.O.

Q3) Answer the following:

- a) Explain the difference between diffusion and sedimentation equilibrium method. [2]
- b) Discuss the relationship between intrinsic viscosity and molecular weight. [3]
- c) What is partial specific volume? How can it be measured? [5]

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

- a) What is scintillation cocktail? Explain in detail.
- b) What are the applications of atomic absorption spectroscopy? Explain any two in brief.

SECTION -II

(Structure Determination of Biomolecules)

Q5) Answer the following:

- a) Draw the schematic diagram of NMR. [2]
- b) Describe the application of ESR. [3]
- c) Discuss instrumental features of IR spectroscopy. Explain the application of IR spectra to biomolecules. [5]

Q6) Attempt the following:

- a) ORD and CD are manifestation of the same phenomenon. Justify. [2]
- b) How will you differentiate the generation of biosensors on the basis of radon reaction. [4]
- c) What is polarization of fluorescence? List the basic rule for interpretation. [4]

Q7) Answer the following:

- a) Explain the theory of MALDI-MS. [2]
- b) Explain the special uses of LCMS in biology and biochemistry. [4]
- c) Describe the theory of GLMS. Enumerate the applications of GLMS.[4]

Q8) Attempt any one of the following:

- a) Describe briefly the theory of MALDI -TOF-MS . What information can be obtained and give its application. [5]
- b) What is circular diacroism techniques? Explain its usefulness in structural analysis of protein. [5]

EEE

Total No. of Questions : 8]

SEAT No. :

P2222

[4824]-203

[Total No. of Pages : 3

M.Sc.

BIOCHEMISTRY

**BCH - 272 : Biostatistics, Computers 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 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.*
- 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) What are three different types of variables? [3]
- b) Write the probability mass function with illustration for each of the following: [3]
 - i) Binomial distribution.
 - ii) Poisson Distribution.
- c) Define the following term with illustration. [4]
 - i) Sample space
 - ii) Probability.

P.T.O.

Q2) Attempt the following:

- a) What is input, output and format statements. [3]
- b) Calculate the arithmetic mean (by both methods direct and short-cut method) from the given data given below: [3]

No.of leans	5	10	15	20	25	30	35	40
No. of Plants	6	5	9	4	3	6	4	3

- c) Calculate variance, standard deviation and the coefficient of variation from the data recorded of the number of pods per plant. Show that which data is more consistent. [4]

Sample A	40	46	47	39	42	54	50	49	40	41
Sample B	46	51	49	40	41	49	60	61	55	49

Q3) Answer the following:

- a) Write on IF and GO TO statements. [2]
- b) Define the term “correlation”. State the types of correlation. Explain using scatter diagram. [4]
- c) Plot less than type Ogive curve for the frequency distribution of seed yield of 100 sesamum plants. Hence locate the median. [4]

Seed Yield (in gms)	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
No. of Plants	4	6	10	26	24	15	10	5

Q4) Answer any one of the following:

- a) Yield of 10 strawberry plants in an uniformity trial are given by Baker and Baker (1953) are as following: [5]
239, 176, 235, 217, 234, 216, 318, 190, 181, 225
Can it be concluded that the average yield is 240. Use 5% level of significance.
- b) Sketch DO LOOP structure and explain it with one simple example. [5]

SECTION - II
(Bioinformatics)

Q5) Answer the following:

- a) What is flat file database? What are the advantages of flat file databases. [3]
- b) What are primary databases? What are the pitfalls in primary databases. [4]
- c) What kind of data will be accepted and not accepted by gene bank. [3]

Q6) Attempt the following:

- a) Define bioinformatics. Explain the significance of bioinformatics in molecular biology. [4]
- b) What do you mean by progressive alignment? Explain how *clustal w* uses progressive alignment for multiple sequence alignments. [4]
- c) What are specialized databases. [2]

Q7) Answer the following:

- a) Write a note on Gap penalty. [3]
- b) What are the merits of multiple sequence alignment over the pair wise alignment. [3]
- c) Which approach of sequence alignment you will use if two sequences are very similar. Global or local? Why? [4]

Q8) Attempt any one of the following:

- a) You are provided with 2 DNA sequences: [5]
Seq 1 : GCTGAGCTGG.
Seq 2 : GCAGACCTGG
Perform pair wise alignment using dot matrix method to qualitatively show the similarity between these sequences.
- b) Differentiate between FASTA and BLAST algorithms. If a match from a sequence database search is reported to have an E-value of 0.0 should it be significant? Why? [5]



Total No. of Questions : 8]

SEAT No. :

P2223

[4824]-204

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both sections should be written on separate sheets.*
- 2) *Questions 4 and 8 are compulsory.*
- 3) *Attempt any two from Q1 to Q3 and any two from Q5 to Q7.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Q1) Attempt the following:

- a) Distinguish between active and passive transport. [3]
- b) Describe role of liposomes in drug delivery. [3]
- c) Give detailed account of constituents of membrane. [4]

Q2) Attempt the following:

- a) Write note on nuclear pores. [4]
- b) Discuss role of sodium potassium ATPase in transport across membrane. [3]
- c) Explain exocytosis with suitable example. [3]

Q3) Attempt the following:

- a) Describe various components of membrane. [5]
- b) What are ionophores. [2]
- c) Write note on ligand gated channels. [3]

P.T.O.

Q4) Attempt any one **[5]**

- a) Give detailed account of structure and properties of biological membrane.

OR

- b) Discuss various components of the membrane that are responsible for carrying out transport across membrane.

SECTION - II

Q5) Attempt the following:

- a) What is renaturation and denaturation of DNA. **[3]**
b) What are genetic disorders? Give suitable example. **[3]**
c) Write note on Z-DNA. **[4]**

Q6) Attempt the following:

- a) What is genetic code? **[2]**
b) Explain term - auxotroph and prototroph. **[3]**
c) Give an account of Mendelian law of inheritance. **[5]**

Q7) Attempt the following:

- a) Explain concept of gene by Benzer. **[3]**
b) What is an operon? Explain with suitable example. **[3]**
c) Explain the terms: fertility factor & co-linearity. Also explain types of RNA in a cell. **[4]**

Q8) Attempt any one: **[5]**

- a) Explain in detail structure of DNA.
b) Explain in detail structure of various types of RNA.



Total No. of Questions :6]

SEAT No. :

[Total No. of Pages : 2

P2224

[4824]-301

M.Sc. (Part-II)

BIOCHEMISTRY

BCH-370:Molecular Biology

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

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 Q1 to Q4.*
- 4) *Question 5 and 6 are compulsory.*

Q1) Answer the following.

- a) What is mismatch repair mechanism? [2]
- b) Write note on Transposable elements in bacteria. [3]
- c) What is role of Rec A in recombination process? [2]
- d) Explain Rho-independent termination process. [3]

Q2) Answer the following:

- a) Define charging of t-RNA. [3]
- b) Give the role of topoisomerase and helicase in DNA replication. [3]
- c) Explain prokaryotic transcription steps in brief. [4]

Q3) Answer the following.

- a) Enlist the enzymes involved in DNA replication process. [3]
- b) Explain the role of spliceosome in splicing? [3]
- c) Explain roles of different enzymes in homologous recombination. [4]

P.T.O.

Q4) Answer the following.

- a) What is shine Dalgarno sequence? [2]
- b) Why are t-RNAs called as adaptor molecule. [3]
- c) What is pribnow box and Hogness box. [2]
- d) Define role of helicase in DNA replication. [3]

Q5) Attempt any two

- a) Write a note on chromatin remodeling. [5]
- b) Explain post translational modification of m-RNA. [5]
- c) Explain retrotransposons and their method of transposition. [5]

Q6) Attempt any two

- a) Write note on inhibitors of protein synthesis. [5]
- b) Discuss process of Nucleotide excision repair system. [5]
- c) Write note on signal hypothesis in protein targeting. [5]



Total No. of Questions :8]

SEAT No. :

P2225

[4824]-302

[Total No. of Pages :3

M.Sc.

BIOCHEMISTRY

BCH - 371: Medical Biochemistry and Immunology

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

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Answer any 2 questions from Q.1 to Q.3 and any 2 questions from Q.5 to Q.7.*
- 2) *Questions No. 4 and 8 are compulsory.*
- 3) *Answer each section on separate answer sheets.*

SECTION -I

(Medical Biochemistry)

Q1) Answer the following:

- a) Describe analgesics. [2]
- b) Explain the mode of action of antibiotics that inhibit the biosynthesis of cell wall with example. [4]
- c) Write a note on mycobacterium and enlist antibiotics used against it.[4]

Q2) Attempt the following:

- a) Write in brief about antifungal drugs. [2]
- b) Describe the molecular basis of hemoglobinopathies and types of mutation seen in it. [4]
- c) Explain in detail extrinsic and intrinsic mechanism of apoptosis. [4]

P.T.O.

Q3) Answer the following:

- a) Explain sickle cell anaemia. [2]
- b) Describe in detail the physiological role of lysosomes and its pathology. [4]
- c) Explain role of puromycin and streptomycin. [4]

Q4) Answer any one of the following:

- a) Describe life cycle of influenza virus. [5]
- b) Describe about the enzymes involved in heart diseases and their importance in pathological finding. [5]

SECTION -II

(Immunology)

Q5) Answer the following:

- a) How does innate immunity differ from acquired immunity? Give example. [3]
- b) Differentiate between RIA and ELISA techniques. [3]
- c) Write a note on: [4]
 - i) Western blotting
 - ii) Immuno diffusion

Q6) Attempt the following:

- a) Explain secondary lymphoid organ. [3]
- b) Explain any one MHL molecule. [3]
- c) Explain the complement activation pathway. [4]

Q7) Answer the following:

- a) Explain phagocytosis. [2]
- b) What are live and attenuated vaccine? Explain the principle of vaccination. [4]
- c) What are interferon? Explain their role in prevention of viral proliferation. [4]

Q8) Answer any one of the following:

- a) Discuss the etiology and development of AIDS. [5]
- b) What are the useful properties of hybridomas. How are they developed. [5]

EEE

Total No. of Questions : 8]

SEAT No. :

P2226

[4824]-303

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

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

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

Neuro Chemistry

Q1) Answer the following:

- a) What are dendrites? [2]
- b) Describe the mechanism of long term potentiation. [4]
- c) What are reverberating and parallel after - discharge circuits? [4]

Q2) Attempt the following:

- a) What are synapses? Describe its types. [3]
- b) Describe the functional nuclei of hypothalamus. [3]
- c) Discuss the components of autonomic nervous system. [4]

Q3) Attempt the following:

- a) What are ganglia? [2]
- b) Describe the functions and mode of action of acetylcholine esterase.[3]
- c) Explain the storage and uptake mechanism of neurotransmitters with example. [5]

P.T.O.

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

- a) Write a note on sensory modalities and sensory circuits.
- b) Describe the various regions of the brain.

SECTION - II

Biochemistry of Specilized Tissues

Q5) Answer the following:

- a) What is electrophelax? [2]
- b) Explain the role of transducin. [4]
- c) Describe the structure and functions of taste bud. [4]

Q6) Attempt the following:

- a) What is the effect of fungaro toxins? [3]
- b) How does the motion of the hair bundle create a change in membrane potential? [3]
- c) Write a note on cell motility. [4]

Q7) Answer the following:

- a) What is intermediate filament? [2]
- b) Explain the role of rhodopsin? [3]
- c) Describe the role of sarcomere, Ca^{2+} , Tn C, Tn I and TnT in muscle contraction. [5]

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

- a) Write a note on chemotaxis.
- b) Discuss the steps involved in the generation of nerve impulses.



Total No. of Questions : 8]

SEAT No. :

P2227

[4824]-304

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH-373 : Toxicology and Plant Biochemistry

(2013 Credit Pattern) (Semester-III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both the sections should be written in different answer sheets.*
- 2) *Solve any two questions from Q. 1 to Q. 3 and any two questions 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) Write the principle of toxicology. [2]
- b) Explain allergic and idiosyncratic reaction. [4]
- c) Write a note on teratology and reproduction. [4]

Q2) Attempt the following:

- a) Classify the toxic agents. [2]
- b) Explain local versus systemic toxicity. [4]
- c) How will you evaluate the toxicity of a substance. [4]

Q3) Answer the following:

- a) What do you mean by animal and plant toxicity? [3]
- b) Explain reversible versus irreversible toxicity. [4]
- c) What is the difference between acute, subacute and subchronic toxicity testing. [3]

P.T.O.

Q4) Attempt Any One of the following:

- a) Explain AIMS test. [5]
- b) Explain phase I and phase II biotransformation reaction. [5]

SECTION-II

Q5) Attempt following:

- a) Explain role of magnesium in plant growth. [3]
- b) Give various pest types and their treatment. [3]
- c) Describe structure of chloroplast with suitable example. [4]

Q6) Attempt the following:

- a) What is senescence? Which plant hormone controls senescence. [2]
- b) Describe light reaction of photosynthesis in detail. [5]
- c) Give brief account of sulphate metabolism. [3]

Q7) Attempt the following:

- a) Elaborate the chemistry of flavonoids and give their application. [4]
- b) Explain role of cytokinin in plant growth. [4]
- c) Write note on dormancy. [2]

Q8) Attempt Any One:

- a) Describe in detail Calvin cycle in C_3 plants. How is efficiency of photosynthesis to be increased in C_4 plants? [5]
- b) Explain in detail N_2 fixation and add a note on assimilation of NH_4^+ ions. [5]



Total No. of Questions : 8]

SEAT No. :

P2228

[4824]-401

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

SECTION-I

(Physiological Biochemistry)

Q1) Answer the following:

- a) What are the different liver disorders? Explain any one. [3]
- b) Explain the physiological function of kidney. [3]
- c) Explain the regulation of respiration. [4]

Q2) Attempt the following:

- a) Write a note on water and mineral metabolism. [3]
- b) Explain the blood clotting cascade. [3]
- c) Write in detail the abnormalities associated with acid-base imbalance. [4]

Q3) Answer the following:

- a) Write a short note on Jaundice. [2]
- b) Explain kidney function test. [4]
- c) Explain the structure of digestive tract and glands. [4]

P.T.O.

Q4) Answer Any One of the following:

- a) Explain liver function test. [5]
- b) Explain the transport and excretion of nutrients. [5]

SECTION-II

(Endocrinology)

Q5) Answer the following:

- a) Describe the metabolic conversions that are required to produce the active form of parathyroid hormone. [2]
- b) What are thyroid hormones? Explain the synthesis of thyroid hormones. [3]
- c) Describe the functions of anterior pituitary hormones. [5]

Q6) Attempt the following:

- a) What are the general effects caused by T_4 & T_3 in the body. [3]
- b) What is EGF? Explain the receptor involve in the action of EGF. [3]
- c) Justify the assertion that GH and prolactin are members of the same “family” of pituitary hormones. [4]

Q7) Answer the following:

- a) What is target cell insensitivity? [2]
- b) What is the difference between diabetes mellitus & diabetes insipidus? What are the characteristic signs of diabetes insipidus? [4]
- c) Discuss the steps involved in the biosynthesis of mineralocorticoids. [4]

Q8) Answer Any One of the following:

- a) The endocrine system not only produces hormones but also has a self-regulating system that senses when to shut them off. What is this system called? Describe how it works. [5]
- b) Write a note on “hormonal interrelationship”. Explain with physiological response of target cells. [5]



Total No. of Questions :8]

SEAT No. :

P2229

[4824]-402

[Total No. of Pages :3

M.Sc.

BIOCHEMISTRY

BCH - 471: Fermentation Technology and Tissue Culture

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

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 questions from Q.5 to Q.7.*
- 4) *Figures to the right indicate full marks.*

SECTION -I

(Fermentation Technology)

Q1) Answer the following:

- a) Write the specific characteristics of industrially important micro-organism. [3]
- b) How will you proceed for isolation of auxotrophic mutants? [3]
- c) Describe in detail the manufacture of beer by fermentation process.[4]

Q2) Attempt the following:

- a) What are various methods of feedback control? [4]
- b) How will you choose a recovery process during fermentation? [3]
- c) How micro-organisms are isolated by enrichment culture techniques?[3]

P.T.O.

Q3) Answer the following:

- a) What is meant by fed batch culture? [3]
- b) Describe in detail the production of penicillin using fermentative process. [4]
- c) Elaborate on the design of fermenters and explain about the maintenance of aseptic condition. [3]

Q4) Attempt any one of the following:

- a) Explain batch and continuous culture. Which method do you think is the best. Justify your answer. [5]
- b) What is meant by media formulation? What are different carbon source used in fermentation? [5]

SECTION -II

(Tissue Culture)

Q5) Answer the following:

- a) Explain different sterilization techniques used during tissue culture. [3]
- b) What are basic requirement of tissue culture lab? [3]
- c) What are advantages and disadvantages of natural and synthetic media? [4]

Q6) Attempt the following:

- a) What do you mean by callus culture? [2]
- b) Describe briefly cell suspension culture. [4]
- c) What are different methods of animal cell preservation? [4]

Q7) Answer the following:

- a) What is somatic embryogenesis? [2]
- b) Discuss briefly cell and tissue *branching?* [4]
- c) What is meant by Haploid culture and embryo culture? [4]

Q8) Answer any one of the following:

- a) What are different techniques used in animal tissue culture. [5]
- b) Describe phytochemistry of the metabolites of medicinal plants. [5]

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Total No. of Questions : 8]

SEAT No. :

P2230

[4824]-403

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH - 472 : Genetic Engineering

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to both sections should be written on separate sheets.*
- 2) *Question 4 and 8 are compulsory.*
- 3) *Attempt any two from Q1 to Q3 and any two from Q5 to Q7.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Q1) Answer the following:

- a) Enlist features of a good vector. [2]
- b) Give a brief account on importance of gene cloning. [4]
- c) What is CDNA library? Give in brief method for its construction. [4]

Q2) Attempt the following:

- a) Explain the toxic action of cry protein. [3]
- b) Give the restriction sites of ECORI, HaeIII, Bam HI. [3]
- c) Explain direct gene transfer method for transformation of plant. [4]

Q3) Answer the following:

- a) What are casmids? Give example. [2]
- b) Enlist and explain applications of southern Blotting technique. [3]
- c) Draw the structure and explain M13 bacteriophage vector. [5]

P.T.O.

Q4) Attempt the following:

a) Explain the principle of pyrasequencing. [5]

OR

b) Write note on restriction enzymes in genetic engineering. [5]

SECTION - II

Q5) Answer the following:

a) What is lepafection? [2]

b) Explain method for producing recombinant insulin. [4]

c) Describe embryonic stem cell transfer technology for production of transgenic animals. [4]

Q6) Attempt the following:

a) Discuss the importance of protein engineering technology. [3]

b) What is PCR. Explain its types. [3]

c) Explain method of producing pest resistant plant. [4]

Q7) Answer the following:

a) Discuss any two applications of RF LP technique. [2]

b) Write note on role of recombinant DNA technology in medicine. [3]

c) Explain phenomenon of RNA interference. [5]

Q8) Attempt the following:

a) Explain process of In-vitro mutagenesis. [5]

OR

b) Describe RNA technology and its application. [5]



Total No. of Questions :4]

SEAT No. :

P2231

[4824]-404

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY (Optional)

BCH-473(II) : Clinical Nutrition

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

Time : 3 Hours]

[Max. Marks : 25

Instructions to the candidates:

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

Q1) Answer the following:

- a) Explain the effect of refining on nutritional quality of food. [2]
- b) Describe the relation of malnutrition with infection. [4]
- c) What are acidic and alkaline foods? Which ions are responsible for acidity & alkalinity of food. [4]

Q2) Attempt the following

- a) Describe the effect of fermentation on nutritional quality of food. [3]
- b) Write a note on geriatric nutrition. [3]
- c) Describe the interrelationship between dietary lipids and cholesterol metabolism. [4]

Q3) Answer the following:

- a) What is irradiation? [2]
- b) Describe the effect of tobacco on human health. [3]
- c) What are the factors which effect on diagestion and absorption of food.[5]

Q4) Attempt any one of the following.

- a) Explain the effect of excersise on physiology of body. [5]
- b) Describe the nutritional management of inborn errors of metabolism.[5]



P.T.O.

Total No. of Questions :4]

P2231

[4824]-404

M.Sc.

BIOCHEMISTRY (Optional)

BCH-473 (III) : Food Technology

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

[Max. Marks : 25

Instructions to the candidates:

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

Q1) Answer the following:

- a) Write a note on single cell protein. [3]
- b) Explain starch production. [3]
- c) Describe the different enzymes used for food processing. [4]

Q2) Attempt the following

- a) What are the different methods of monitoring food quality. [3]
- b) Write a note on primary feed stock. [3]
- c) Explain the difference in natural and synthetic sweeteners. [4]

Q3) Answer the following:

- a) Write a note on meat tenderisation. [3]
- b) Differentiate the features of foods obtained from plant and animal origin. [3]
- c) Discuss the different methods of food preservation. [4]

Q4) Answer any one of the following.

- a) How are the foods modified genetically. [5]
- b) Explain in detail the enzymes used in food analysis. [5]

