

Total No. of Questions : 8]

SEAT No. :

P2856

[5531]-101

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH-170 : Biomolecules

(2013 Pattern) (Semester - I) (Credit System) (5 Credits)

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 two questions from Q.1 to Q.3 and Q.5 to Q.7.*
- 4) *Q.4 and Q.8 are compulsory.*
- 5) *All questions carry equal marks.*

SECTION - I

(Biomolecules - I)

Q1) Answer the following :

- a) Give the structure of a heterodisaccharide. **[3]**
- b) Write a note on rancidity of lipids. **[3]**
- c) List out the coenzyme forms of Vitamin B complex with their significance. **[4]**

Q2) Answer the following :

- a) Define saponification number and give its significance. **[2]**
- b) Classify lipids with suitable examples. **[5]**
- c) Differentiate between anomers and epimers. **[3]**

Q3) Answer the following :

- a) Draw the structure of three phospholipids. **[3]**
- b) Define K_a and pK_a and give its significance. **[2]**
- c) Discuss the source, Functions and deficiency of Vitamin A. **[5]**

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

- a) Explain the reactions of Glucose with oxidizing and reducing reagents.
- b) Discuss the types and significance of lipoproteins.

P.T.O.

SECTION - II
(Biomolecules - II)

Q5) Answer the following

- a) Write the structure of two polar amino acids. [2]
- b) Write note on denaturation of proteins. [3]
- c) Explain the titration curve of neutral amino acid and its significance. [5]

Q6) Answer the following

- a) What are nonstandard amino acids? Give examples. [2]
- b) Classify amino acids based on their R chain. [5]
- c) Give the significance of rare amino acids. [3]

Q7) Answer the following

- a) Give the reaction of amino acid with Ninhydrin reagent. [2]
- b) Write note on features of peptide bond. [4]
- c) Differentiate between Alpha helix and Beta pleated structures. [4]

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

- a) Explain Bruce Merfield's solid phase synthesis of peptide.
- b) Describe the steps involved in determination of primary structure of proteins.



Total No. of Questions :8]

SEAT No. :

P2857

[5531]-102

[Total No. of Pages :2

M.Sc.

BIOCHEMISTRY

**BCH - 171 : Enzymology And Biophysical Techniques
(2013 Pattern) (Semester - I) (Credit System) (5 Credits)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

SECTION - I
(Enzymology)

Q1) Answer the following.

- a) What is positive co-operativity? Explain with suitable example. [2]
- b) Differentiate between coenzyme and cofactors with example. [3]
- c) What are the types of bisubstrate reaction? How bisubstrate reactions involving ternary complex are differentiated from those not involving ternary complexes? [5]

Q2) Attempt the following.

- a) What is the catalytic triad of chymotrypsin? [3]
- b) How do the differences in specificity between chymotrypsin and related protease arise? [3]
- c) What is the effect of acid-base catalysis on an enzyme catalyzed reaction? [4]

Q3) Answer the following.

- a) What is enzymatic activity? [2]
- b) Describe any one theoretical model that has been used to describe conformational changes in controlling the activities of enzymes. [4]
- c) Write a note on enzyme turnover. [4]

P.T.O.

Q4) Attempt any one of the following.

- a) Discuss in detail effect of substrate concentration on enzyme catalyzed reaction (including Michaelis-Menten equation). [5]
- b) How does trypsin activate chymotrypsinogen? What is the difference between trypsin and chymotrypsin? [5]

SECTION - II
(Biophysical Techniques)

Q5) Answer the following.

- a) How does the spectrophotometer work? [2]
- b) Describe any one application of nitrocellulose filter. [3]
- c) Write the principle and application of HPLC. [5]

Q6) Attempt the following.

- a) What is SDS? What are its functions in SDS-PAGE? [3]
- b) Explain the procedure to separate DNA fragments by agarose gel electrophoresis. [3]
- c) What physical characteristics of a biomolecules influence its rate of movement in an electrophoresis matrix? [4]

Q7) Answer the following.

- a) Why do we isolate proteins? [2]
- b) Describe any two methods for immobilization of ligands. [4]
- c) Differentiate between partition and adsorption chromatography with examples. [4]

Q8) Attempt any one of the following.

- a) Write a note on isoelectric focusing. [5]
- b) Briefly describe how paper chromatography works with the unknown mixtures. [5]



Total No. of Questions : 8]

SEAT No. :

P2858

[5531]-103

[Total No. of Pages : 3

M.Sc.

BIOCHEMISTRY

BCH-172 : Microbiology and Cell Biology

(2013 Pattern) (Semester - I) (Credit System) (5 Credits)

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 two questions from Q. 1 to Q. 3 and Q. 5 to Q. 7.*
- 4) *Question 4 and 8 are compulsory.*
- 5) *All question carry equal marks.*

SECTION-I

(Microbiology)

Q1) Answer the following:

- a) Give the classification of plant and animal viruses. [2]
- b) Explain different physical agents in control of microorganisms. [3]
- c) Explain the principle working and application of phase contrast microscope. [5]

Q2) Answer the following:

- a) Define exotoxin and endotoxin. [2]
- b) Explain the structure of bacterial membrane. [3]
- c) How dyes and heavy metals are useful in controlling growth of microbes? [5]

P.T.O.

Q3) Answer the following:

- a) Difference between procaryotic & eukaryotic cells. [2]
- b) Explain host microbe interaction in detail. [4]
- c) Give the different phases of bacterial growth curve. [4]

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

- a) Explain the nitrogen cycle in detail.
- b) Define sterilization, antimicrobial agents, sanitizer, disinfectant, and bactericide.

SECTION-II

(Cell Biology)

Q5) Answer the following:

- a) What is cell theory? [2]
- b) Classify fungi and give its biological importance. [3]
- c) Draw a well labeled diagram of an animal cell and explain the function of any three cell organelles. [5]

Q6) Answer the following:

- a) Distinguish between heterochromatin and euchromatin. [2]
- b) Describe the chemical composition of plasma membrane. [3]
- c) Define the term fertilization. What is the significance of fertilization? Explain. [3]

Q7) Answer the following:

- a) Enlist the different constituents of nucleus. [2]
- b) Brief about spermatogenesis and oogenesis with an illustration. [4]
- c) Write a note on marker enzymes of various cell organelles with suitable examples. [4]

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

- a) Write a note on different types of transport mechanism across plasma membrane.
- b) Explain in detail fractionation of cell organelles, by appropriate method.



Total No. of Questions : 8]

SEAT No. :

P2861

[5531]-203

[Total No. of Pages : 3

M.Sc.

BIOCHEMISTRY

BCH-272 : Biostatistics, Computer and Bioinformatics

(2013 Pattern) (Semester-II) (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 two questions from Q1 to Q3 and any two from Q5 to Q7.*
- 4) *Question 4 and 8 are compulsory.*
- 5) *All questions carry equal marks.*

SECTION-I

(Biostatistics and Computers)

Q1) Answer the following:

- a) Define mean and mode of grouped frequency distribution. [2]
- b) Obtain mode of the following data graphically. [4]

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	5	10	18	15	6	16	1

- c) Find out the arithmetic mean and median of the following data: [4]

No. of seeded plants	10	7	6	12	5	7	16	8	20
No. of plants	40	26	47	43	49	60	50	29	30

Q2) Answer the following:

- a) Compute median of the following data: [3]
8, 9, 11, 12, 5, 6, 3, 8, 9, 10, 14, 12, 15, 16

- b) Obtain mean of the following data: [3]

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	1	6	4	3	2

- c) What do you mean by: [4]

- i) Mean variants
- ii) Standard deviations

P.T.O.

Q3) Answer the following:

- a) Define probability of an event. [2]
- b) Draw the histogram of the following data and mention its distribution shape. [5]

No. of pods	No. of plants
0-6	4
6-12	8
12-18	15
18-24	20
24-30	12

- c) Draw a percentage bar diagram and pie diagram of the following data. [3]

Crops	Area in thousand hectares
Rice	3126
Jowar	25
Wheat	256
Bajra	200
Maize	1000

Q4) Answer any one: [5]

- a) Explain the difference between hardware and software and give its importance.
- b) Write a program to accept two numbers and display greatest number between two.

SECTION-II

(Bioinformatics)

Q5) Attempt the following:

- a) Define orthologs and paralogs. [2]
- b) Give the application bioinformatics in pharmacy. [4]
- c) PDB (Protein data base). [4]

Q6) Distinguish between the following:

- a) BLASTA and FASTA. [4]
- b) Global and Local alignment. [3]
- c) PAM and BLOSUM Matrix. [3]

Q7) Answer the following:

- a) Write a note on gap penalty. [3]
- b) Explain how multiple sequence alignment can be used to find out the conserved region of protein sequence. [3]
- c) Explain how sequence data is generated for Expressed sequence Tags database division of NCBI. [4]

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

- a) Explain why there is a need of heuristics approach in data base sequence search. Explain any one heuristics approach in sequence similarity search.
- b) You have isolated one protein, how will you find its shape and structure.



Total No. of Questions : 8]

SEAT No. :

P2862

[Total No. of Pages : 2

[5531]-204

M.Sc.

BIOCHEMISTRY

BCH-273 : Membrane Biochemistry and Genetics

(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 sheets.*
- 2) *Question 4 and Question 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

(Membrane Biochemistry)

Q1) Answer the following:

- a) Explain co-transport of chloride in humans. [3]
- b) Elaborate interaction between protein-lipid in membranes. [3]
- c) Give the role of gramicidin as a transport antibiotic. [4]

Q2) Answer the following:

- a) Explain flip-flop nature of membrane. [2]
- b) What are binding protein. Explain with examples. [3]
- c) Lipids are major constituent of biological membrane. Explain. [5]

Q3) Answer the following:

- a) What is osmoregulation? [2]
- b) What are different types of transport mechanism. Explain role of protein in transport. [4]
- c) Write in detail structure and significance of miscells. [4]

P.T.O.

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

- a) How do membrane lipids influence curvature of membrane.
- b) Write note on sodium channel & its significance.

SECTION-II

(Genetics)

Q5) Answer the following:

- a) Explain Watson and Crick model of DNA. [3]
- b) Give an account of lytic cycle in bacteriophage. [3]
- c) Explain Hardy-Weinberg principle. [4]

Q6) Answer the following:

- a) Distinguish between specialized & generalized transduction. [3]
- b) Explain human teratogenesis. [3]
- c) What are Auxotroph, Prototroph and conditional mutants? [3]

Q7) Answer the following:

- a) What is pedigree analysis? Explain with example. [3]
- b) Define Aneuploidy, euploidy, trisomy. [3]
- c) Explain law of independent assortment. [4]

Q8) Explain any one in detail: [5]

- a) Explain lactose operon.
- b) Discuss Avery, Macleod & McCarty experiment and its interpretations.



Total No. of Questions : 6]

SEAT No. :

P2863

[5531]-301

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH-370 : Molecular Biology

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) Answer the following :

- a) What are Okazaki fragments? [2]
- b) Explain Base excision repair mechanism. [3]
- c) Define mobile genetic elements and give an example. [2]
- d) Explain the subunit composition of DNA polymerase III holoenzyme. [3]

Q2) Answer the following :

- a) Describe mechanism of splicing followed by Group I introns. [3]
- b) What are telomerase and what is its significance? [3]
- c) Discuss the process of transcription termination in prokaryotes. [4]

Q3) Answer the following :

- a) Explain pyrimidine dimer formation. [3]
- b) Write note on inhibitors of protein synthesis. [3]
- c) Explain Holiday model of recombination. [4]

Q4) Answer the following :

- a) Explain the structure of chromatin. [2]
- b) Write a note on Initiation of translation in eukaryotes. [3]
- c) Brief about RNA editing. [2]
- d) Differentiate between adenovirus and retrovirus. [3]

P.T.O.

Q5) Attempt any two

- a) Describe post translational modifications events in detail. [5]
- b) Elucidate spliceosome mediated splicing event in Eukaryotic system. [5]
- c) Explain the role of all the enzymes involved in DNA synthesis. [5]

Q6) Attempt any two

- a) Write note on capping and poly A tail addition. [5]
- b) Explain chromatin remodeling. [5]
- c) Explain the mitochondrial transportation of protein. [5]



Total No. of Questions :8]

SEAT No. :

P2864

[5531]-302

[Total No. of Pages :2

M.Sc.

BIOCHEMISTRY

BCH - 371 : Medical Biochemistry and Immunology

(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 two questions from Q.1 to Q.3 and from Q.5 to Q.7.*
- 4) *Question 4 and 8 are compulsory.*
- 5) *All question carry equal marks.*

SECTION - I

Medical Biochemistry

Q1) Answer the following.

- a) What are isoenzymes? Elaborate on its role. [2]
- b) What are antibiotics? Explain the mechanism of action of streptomycin and tetracycline at the molecular level. [4]
- c) What are abnormal hemoglobins? Elaborate on the molecular basis of sickle - cell Anaemia. [4]

Q2) Answer the following.

- a) Elaborate on the normal composition of Cerebrospinal fluid. [2]
- b) Describe hallucinogens. [5]
- c) Discuss the mechanism of carcinogenesis. [3]

Q3) Answer the following

- a) How micro-organism develop resistance to antibiotics. [2]
- b) Explain the processes of programmed cell death. [4]
- c) Elaborate the mechanism of fibrin formation. [4]

P.T.O.

- Q4)** Answer any one of the following. [5]
- a) Give the etiology of cancer.
 - b) Discuss on arteriosclerosis.

SECTION - II
Immunology

- Q5)** Answer the following.
- a) Define Immunology. [2]
 - b) Explain the MHC molecule in details. [4]
 - c) Explain the importance of immuno-electrophoresis over immono-diffusion techniques. [4]

- Q6)** Answer the following.
- a) Define isotype and allotype. [2]
 - b) Describe the classical compliment pathway. [4]
 - c) Describe immunoelectron microscopy. [4]

- Q7)** Answer the following.
- a) Give the principle of RIA. [2]
 - b) Enlist the different types of immunity generated in body and explain the correlation between humoral and acquired immunity. [4]
 - c) Explain the structure of immunoglobulin molecule. Give the characteristic function of each class. [4]

- Q8)** Answer any one of the following. [5]
- a) Explain Recombinant Vaccines and Polyvalent vaccines.
 - b) Discuss the features of immunodeficiency diseases with example.



Total No. of Questions : 8]

SEAT No. :

P2865

[5531]-303

[Total No. of Pages : 3

M.Sc.

BIOCHEMISTRY

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to the two sections should be written in separate answer books.*
- 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 side indicate full marks.*

SECTION-I

(Neurochemistry)

Q1) Answer the following:

- a) What is a sensory modality? [2]
- b) Describe the components of an autonomic reflex. [4]
- c) What are the components of diencephalon? Describe the functions of the diencephalon. [4]

Q2) Attempt the following:

- a) Describe the functions of spinal cord. [3]
- b) What is circadian rhythm? Explain the role of biomescules involved in circadian rhythm. [3]
- c) How is neurotransmitter removed from the synaptic cleft? [4]

P.T.O.

Q3) Answer the following:

- a) What is long-term potentiation? [2]
- b) Distinguish between gray matter and white matter. [3]
- c) Compare the locations and functions of the direct and indirect motor pathways. [5]

Q4) Attempt any one of the following:

- a) Explain the formation and circulation of cerebrospinal fluid. [5]
- b) Describe the different ways to classify sensory receptors. [5]

SECTION-II

(Biochemistry of Specialized Tissues)

Q5) Answer the following:

- a) What is chemotaxis? What is positive chemotaxis? [2]
- b) Compare the basic types of ion channels, and explain how they relate to graded potentials and action potentials. [4]
- c) How does the sense of touch work? [4]

Q6) Attempt the following:

- a) Discuss the mechanism involved in the movement of cilia and flagella. [3]
- b) Discuss the effects of neurotoxins on the nervous system. [3]
- c) What is the relationship between ATP and creatine phosphate in the production of energy used for skeletal muscle contractions? [4]

Q7) Answer the following:

- a) What are the differences between taste and olfaction receptors? [2]
- b) Define contraction cycle and explain the four steps involved in contraction cycle. [3]
- c) List the steps of the configuration changes that occur to the photopigments upon absorption of a photon. [5]

Q8) Attempt any one of the following:

- a) What are motor proteins? Describe the structure and function of any two motor proteins. [5]
- b) List the sequence of events that generate an action potential. [5]



Total No. of Questions :8]

SEAT No. :

P2866

[5531]-304

[Total No. of Pages :2

M.Sc.

BIOCHEMISTRY

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

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

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

SECTION-I

(Toxicology)

Q1) Answer the following.

- a) Write the principle of toxicology. [2]
- b) Explain in detail AIMS test. [4]
- c) Explain local versus systemic toxicology. [4]

Q2) Answer the following.

- a) What are animal and plant toxins? [2]
- b) Explain the components of cytochrome P 450 monooxygenase system. [4]
- c) Give the forensic application of toxicology. [4]

Q3) Attempt the following.

- a) Give the classification of toxicology. [2]
- b) Write a note on reproduction and teratology. [4]
- c) Explain phase I and phase II biotransformation reaction. [4]

P.T.O.

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

- a) Explain in detail how the route of entry of any chemicals is dependent on its toxicity.
- b) Explain in detail how will you perform acute, subacute, chronic and subchronic tests.

SECTION-II

(Plant Biochemistry)

Q5) Answer the following.

- a) Give the difference between cyclic and non-cyclic electron flow in photosynthetic system. [2]
- b) Explain the nitrogen cycle in detail. [4]
- c) Describe somatic cell hybridisation. [4]

Q6) Answer the following.

- a) Enlist micro and macro minerals required for plant growth. [2]
- b) Give the role of hormones in senescence and abscission. [4]
- c) What are secondary metabolites? Explain in detail chemistry, classification and its application. [4]

Q7) Attempt the following.

- a) What is the role of cytokinin in plant growth? [2]
- b) Give the assimilation of nitrates in nitrogen fixation. [4]
- c) Describe any three plant diseases with respect to pest, symptoms and treatment. [4]

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

- a) What is plant breeding? Give application of plant breeding in crop improvement with suitable examples.
- b) Explain C₃ and C₄ pathway.



Total No. of Questions :8]

SEAT No. :

P2867

[5531]-401

[Total No. of Pages :2

M.Sc.

BIOCHEMISTRY

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

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer to the two sections should be written in separate answer books.*
- 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 side indicate full marks.*

SECTION-I

(Physiological Biochemistry)

Q1) Answer the following:

- a) What is jaundice? What causes Jaundice? [2]
- b) Describe the basic processes performed by the digestive system. [3]
- c) Explain the difference between intrinsic and extrinsic pathway of blood clotting. [5]

Q2) Attempt the following:

- a) What is tubular reabsorption? [3]
- b) Why Vitamin K is important in blood clotting? [3]
- c) How do temperature H^+ , pCO_2 , and BPG influence the affinity of Hb for O_2 ? [4]

Q3) Answer the following:

- a) What is the difference between gas exchange and respiration? [2]
- b) Explain the functions of pancreatic amylase, aminopeptidase, gastric lipase and deoxyribonuclease. [4]
- c) How the body maintains water balance? [4]

P.T.O.

Q4) Attempt any one of the following:

- a) Explain the mechanism of transport of oxygen and carbon dioxide in the blood [5]
- b) Describe the routes and mechanisms of tubular reabsorption and secretion. [5]

SECTION-II

(Endocrinology)

Q5) Answer the following:

- a) What are the target cells of growth hormone? What are its effects? [2]
- b) Which hormone stimulates the production of cortisol? How production of cortisol is regulated? [3]
- c) Explain the structural features of insulin during its synthesis. [5]

Q6) Attempt the following:

- a) Describe the steps involved in synthesis and release of thyroid hormones. [3]
- b) Explain the role of cAMP as second messenger. [3]
- c) What is target cell insensitivity? Describe the relation between over production and target cell insensitivity with example. [4]

Q7) Answer the following:

- a) Define “releasing” and “inhibiting” hormones. [2]
- b) Write a note on ‘Hormonal-interrelationship’. [4]
- c) Give the function and mode of action of gastrointestinal hormones. [4]

Q8) Attempt any one of the following:

- a) What is the difference between type I diabetes mellitus and type II diabetes mellitus? [5]
- b) How secretion of posterior pituitary hormone is regulated? [5]



Total No. of Questions : 8]

SEAT No. :

P2869

[Total No. of Pages : 2

[5531]-403

M.Sc.

BIOCHEMISTRY

BCH-472 : Genetic Engineering

(2013 Pattern) (Semester-IV) (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 two questions from Q1 to Q3 and Q5 to Q7.*
- 4) *Question 4 and 8 are compulsory.*
- 5) *All questions carry equal marks.*

SECTION-I

Q1) Answer the following:

- a) Differentiate between transformation and transfection process. [2]
- b) Give methods for identification of transformed and non transformed cells. [4]
- c) Write a note on Restriction endonucleases citing its importance in genetic engineering. [4]

Q2) Answer the following:

- a) What are difference between cloning vectors and expression vector?[2]
- b) Write a note on pBR 322 vector. [4]
- c) Discuss Southern blotting method and its application. [4]

Q3) Answer the following:

- a) Write a note on blue-white screening. [2]
- b) How to determine position of exon-intron by using S1 nuclease assay?[4]
- c) Write a note on Chromosomal walking. [4]

P.T.O.

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

- a) Explain how cDNA library is constructed and how it differs from genomic library?
- b) Explain dideoxy method of DNA sequencing.

SECTION-II

Q5) Answer the following:

- a) What are the different systems of recombinant protein production? [2]
- b) What is PCR? Explain the methods of any two types of PCR. [3]
- c) Discuss the technique of RFLP and its application. [5]

Q6) Answer the following:

- a) What are the applications of protein engineering? [2]
- b) Describe chemical and physical methods to produce transgenic animals. [4]
- c) Explain Antisense RNA technology with any one example. [4]

Q7) Answer the following:

- a) What do you mean by genome annotations? [2]
- b) Explain the mechanism of RNAi. [4]
- c) Write a note on recombinant vaccines citing any one example. [4]

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

- a) Discuss the applications of GE in Medicine and Agriculture.
- b) What is in vitro mutagenesis? Describe oligonucleotide based method of introducing mutation.



Total No. of Questions : 8]

SEAT No. :

P2870

[5531]-404

[Total No. of Pages : 2

M.Sc.

BIOCHEMISTRY

BCH-473 : Clinical Nutrition and Food Technology

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

SECTION-I

(Clinical Nutrition)

Q1) Answer the following:

- a) Which toxic chemical is present in tea? [2]
- b) Describe the relationship between dietary cholesterol and lipid metabolism. [4]
- c) Enlist the organs affected by alcohol consumption with its effect. [4]

Q2) Answer the following:

- a) What is acidic food? Explain with example. [3]
- b) Write a short note on irradiation and refining of food. [3]
- c) Explain the parameters of assess the PEM. [4]

Q3) Answer the following:

- a) Explain the effect of exercise on metabolic adaptation. [3]
- b) What are the inborn errors of metabolism? Explain its management. [4]
- c) What are the effect of food quality on mental development. [3]

P.T.O.

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

- a) What is kwashiorkor? Enlist symptoms and causes.
- b) Describe the nutritional status of dairy product and cereals in India.

SECTION-II

(Food Technology)

Q5) Answer the following:

- a) List the toxic substances present in plant food. [3]
- b) What are flavoring agents? Explain their role in food technology. [3]
- c) Describe the sensory evaluation of food in detail. [4]

Q6) Answer the following:

- a) Explain how measurement of colors in food is done? [3]
- b) Explain how the texture of food is analyzed. [3]
- c) Explain microbial toxins and toxins in animal food. [4]

Q7) Answer the following:

- a) Write the note on food additives. [3]
- b) Explain the manufacture of natural and synthetic syrups. [3]
- c) How will you process for production of starch. [4]

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

- a) Explain how food is modified genetically.
- b) Discuss the role of different enzymes used in food processing.

