

Total No. of Questions : 08]

SEAT No. :

P2793

[Total No. of Pages : 2

[5024] - 101

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) *Question 4 and 8 are compulsory.*
- 3) *Attempt any two questions Q 1 to Q 3 and any two from Q 5 to Q 7*
- 4) *Figures to right indicate full marks*

BIOMOLECULES - I

Q1) Answer the following.

- a) Explain terms biomolecules, macromolecules, coenzyme [3]
- b) Write note of ionization of water . [3]
- c) Explain classification of carbohydrates . [4]

Q2) Answer the following ;

- a) What is meant by LDL, HDL ? [2]
- b) Explain structure and reactions of riboflavin . [4]
- c) Differentiate between water and fat soluble vitamins . [4]

Q3) Answer the following :

P.T.O.

- a) What are weak acids and weak bases. Explain with suitable examples. [3]
- b) Write note on different reactions of monosaccharides. [5]
- c) Define epimer and enantiomer . [2]

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

- a) Describe the interaction of biomolecules in aqueous system.
- b) Write note on biological significance of carbohydrates

BIOMOLECULES - II

Q5) Answer the following :

- a) Explain the features and importance of peptide bond . Draw an example of tripeptide . [3]
- b) Give classification of amino acids in details . [3]
- c) Explain β -structure of protein in details . [4]

Q6) Answer the following :

- a) Draw structure of any two rare amino acids . [2]
- b) Explain fibrous protein with appropriate example. [4]
- c) Give the importance of different kinds of forces in stabilizing the structure of protein . [4]

Q7) Answer the following :

- a) Explain the structure of haemoglobin . [5]
- b) Draw Ramchandran plot . [3]
- c) Define motifs . [2]

Q8) Answer any one of following : [5]

- a) Write note on protein sequencing .
- b) Compare the different kinds of secondary structures in protein .

Total No. of Questions : 08]

SEAT No. :

P2794

[Total No. of Pages : 3

[5024] - 102

M.Sc. (Semester - I)

BIOCHEMISTRY

BCH - 171 : Enzymology and Biophysical Techniques

(2013 Pattern) (Credit System)

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 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 right indicate full marks*

SECTION - I

ENZYMOLGY

Q1) Answer the following.

- a) Define allosteric enzymes [2]
- b) What is the effect of pH on enzyme catalyzed reaction . [4]
- c) Explain the reversible change in covalent structure controls the enzyme activity . [4]

Q2) Attempt the following ;

- a) Give an account of enzyme specificity and catalytic power of an enzyme . [3]
- b) What do you understand by activation energy . [3]
- c) Explain the mechanism of enzyme degradation . [4]

P.T.O.

Q3) Answer the following :

- a) Explain any one factor leading to rate of enhancement of enzyme catalyzed reactions [2]
- b) What is the difference between general acid-base catalysis and specific acid -base catalysis ? [3]
- c) Define enzyme inhibition. Explain types of enzyme inhibition with example . [5]

Q4) Attempt any one of the following :

- a) Describe the effect of substrate concentration on enzyme catalyzed reaction . [5]
- b) Explain the charge relay system in chymotrypsin . [5]

SECTION - II

(BIOPHYSICAL TECHNIQUES)

Q5) Answer the following :

- a) What is the principle of ion exchange chromatography? [2]
- b) What is DNA agarose gel electrophoresis ? Explain how it is useful for characterization of DNA molecule [4]
- c) Give the principle of metal-chelate chromatography. [4]

Q6) Attempt the following :

- a) Describe any three advantages of size exclusion chromatography . [3]
- b) What is the principle of DNA cellulose chromatography. Describe its applications . [3]
- c) Discuss the theory of UV-visible spectrophotometer .How it is useful for structural characterization of biomolecules . [4]

Q7) Answer the following :

- a) What is the difference between an isocratic pump and a gradient pump? [2]
- b) Give the principle of isoelectric focusing . [3]
- c) Describe the component of HPLC . [5]

Q8) Attempt any one of the following :

- a) What is the principle of 2D PAGE? Explain its application in proteomics study . [5]
- b) What is dialysis ? Explain method and application of dialysis . [5]

Total No. of Questions : 08]

SEAT No. :

P2795

[Total No. of Pages : 2]

[5024] - 103

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 questions No. 8 are compulsory.*
- 3) Attempt any two 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 questions.

- a) Explain gram staining method . [2]
- b) Explain in detail electron microscopy for studying micro organism with its limitation . [5]
- c) Write a note on symbiotic nitrogen fixation . [3]

Q2) Attempt the following questions:

- a) Write a note on antibiotics with example . [3]
- b) Enlist different methods of isolation of pure culture . Explain any one in detail . [5]
- c) Give the replication of bacterial viruses . [2]

P.T.O.

Q3) Answer the following :

- a) What do you mean by endotoxin . [2]
- b) Give the application of different physical agents in control of micro - organisms . [5]
- c) How the host microbe interaction takes place to cause an infection. [3]

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

- a) What is virulence? comments on the different factors contributing to the pathogenicity of micro-organism.
- b) Define Autotrophs, heterotrophs, lithotrophs, phototrophs and chemotrophs . [5]

SECTION - II
(CELL BIOLOGY)

Q5) Answer the following :

- a) What is difference between prokaryotic and eukaryotic cells. [3]
- b) Write a note on structure and function of chloroplast . [3]
- c) Differentiate between mitosis and meiosis . [4]

Q6) Answer the following :

- a) Write a note on major groups of fungi . [5]
- b) What are different classes of chromosomes . [3]
- c) Why are mitochondria termed as 'power house' of cell . [2]

Q7) Answer the following :

- a) Differentiate between active and passive transport . [2]
- b) Define term fertilization. What is significance of fertilization . [5]
- c) What is stem cell and what are its different types . [3]

Q8) Answer any one of following :

- a) Write note on density gradient centrifugation. [5]
- b) Write note on organogenesis. [5]

Total No. of Questions : 08]

SEAT No. :

P2796

[Total No. of Pages : 2

[5024] - 201

M.Sc.

BIOCHEMISTRY

BCH - 270 : Bioenergetics and Metabolism

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answers to both section 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 process of oxidative phosphorylation . [3]
- b) Describe the ketone bodies formation . [3]
- c) Write note on anapleurotic reactions . [4]

Q2) Attempt the following ;

- a) Explain the structure and role of fattyacid synthase complex . [4]
- b) Describe glycogenolysis . [3]
- c) What are high energy compounds. Give example . [3]

P.T.O.

Q3) Attempt the following :

- a) Explain in brief electron transport chain . [3]
- b) Describe glyoxalate cycle and give its significance . [4]
- c) Explain amphibolic nature of TCA cycle . [3]

Q4) Answer any one :

[5]

- a) Explain in detail β -oxidation of fatty acids .
- b) Explain in detail Gluconeogenesis .

SECTION - II

Q5) Attempt the following :

- a) What is decarboxylation of amino acids. Give its significance [4]
- b) Elaborate Glycine synthesis . [3]
- c) Explain the biosynthesis of sulphur containing aminoacids . [3]

Q6) Attempt the following :

- a) Write a note on salvage pathway of purine . [3]
- b) Explain inborn errors of amino acid metabolism . [3]
- c) Explain transamination reaction in detail . [4]

Q7) Attempt the following :

- a) Explain pathway of pyrimidine degradation . [4]
- b) Explain Glutathione . [3]
- c) Draw diagram which show contribution of all carbon and nitrogen atoms in formation of purine nucleus . [3]

Q8) Attempt any one :

[5]

- a) Explain urea cycle .
- b) Write note on Porphyrin biosynthesis .

Total No. of Questions : 08]

SEAT No. :

P2797

[Total No. of Pages : 2]

[5024] - 202

M.Sc.

BIOCHEMISTRY

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

SECTION - I

Biophysical Methods

Q1) Answer the following.

- a) Enlist the factor affecting sedimentation velocity [2]
- b) Explain the theory of X-ray [4]
- c) Draw a neat diagram of atomic absorption spectroscopy. Describe the theory [4]

Q2) Attempt the following

- a) What is viscosity [2]
- b) Write a note on isotope tracer technique [3]
- c) How will you measure radioactivity by geiger Muller counter [5]

P.T.O.

Q3) Answer the following :

- a) Define and give the significance of sedimentation coefficient [2]
- b) What are methods used for measurement of viscosity of the solution [3]
- c) Distinguish between boundary and hand sedimentation [5]

Q4) Answer any one of the following :

- a) What is meant by semitization of autoradiography [5]
- b) Give the application of partial specific volume. How it is measured by pycrometry [5]

SECTION - II

Structure Determination of Biomolecules

Q5) Answer the following :

- a) Define ORD and CD [2]
- b) Explain the use of fluorescence spectroscopy in cell biology [4]
- c) Explain the mechanism of glucose oxidase biosensors [4]

Q6) Attempt the following :

- a) ERS can be used only with unpaired election molecules. Explain [3]
- b) What is meant by chemical shift in NMR spectroscopy? Add a note on splitting pattern of oldehyde [5]
- c) Give the principle of IR spectroscopy [2]

Q7) Answer the following :

- a) Comment on principle and application of light scattering [3]
- b) Explain the matrix used in MACDI [3]
- c) Based upon bio catalyst and transducer how biosensors are classified [4]

Q8) Attempt any one of following [5]

- a) Give the theory, principle and application of LCMS.
- b) Explain study of conformational changes occuring in DNA histone inheraction by CD analysis.

Total No. of Questions : 8]

SEAT No. :

P2798

[Total No. of Pages : 3

[5024] - 203

M.Sc. (Semester - II)

BIOCHEMISTRY

BCH - 272 : Biostatistics Computer and Bioinformatics

(2013 Pattern) (Credit System)

Time : 3 Hour]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answer to both the section 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 paper will be provided.

SECTION - I

Biostatistics and Computers

Q1) Answer the following:

- a) Explain in short how biostatistics and Biochemistry are related. [2]
- b) Find the cumulative and relative frequency of the following data [5]

No. of Pods	10-20	21-30	31-40	41-50	51-60
No. of Plants	6	25	15	20	10

- c) Calculate the geometric mean of the following [3]

Variable	18	19	20	21	22	23
Frequency	20	10	9	7	4	2

P.T.O.

Q2) Attempt the following :

- a) Draw the histogram of the following data [3]

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

- b) An average of 10 litres of milk is given by a buffalo every day. Assuming this to be a poisson distribution what is the probability that exactly 0,1,2,3,4,5 litres of milk is given per day by the buffalo? [3]

- c) Following is the data recorded on nitrate content of water (mg/l) from two sea. Analyse the data and show whether the two sea are significantly different. [4]

Sample	1	2	3	4	5	6	7	8
Sea I	0.62	0.87	0.50	1.26	0.90	0.85	1.20	1.10
Sea II	0.79	1.68	1.20	0.66	1.62	1.49	1.24	1.86

Q3) Answer the following :

- a) For the standard normal variate $z = 1.98$ find the proportion (area) occupied by it as measured from zero represent in normal distribution curve [2]

- b) Calculate the standard deviation and standard error of data on wavy endospermic plants recorded in maize [4]

Wavy endospermic plants	7	8	9	10	11	12
No. of plants	13	13	18	17	15	14

- c) Height (inches) and weight (kgs) are recorded for 10 students the result are given below. Calculate the regression coefficient and test the level of significance. [4]

Height (inches)	55	68	70	60	78	63	72	58	65	72
Weight kg	50	60	50	54	61	54	65	50	65	60

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

- a) Draw a percentage bar diagram and pie diagram of the following data relating to the areas under cultivation of different crops in Maharashtra in the year 1990-91

Crops	Wheat	Bajra	Rice	Maize	Jowar
Area in thousand hectars	110	200	2570	300	3120

- b) Explain hard ware and software and difference between hardware and software. [5]

SECTION - II

Bioinformatics

Q5) Answer the following :

- a) Write a note on BLOSSUM matrices. [3]
- b) Explain how multiple sequence alignment can be used to find the conserved region of protein sequences. [3]
- c) What is Entrez? Describe why entrez in most powerful tool to retrieve the biological data. [4]

Q6) Attempt the following :

- a) Differentiate between sequence similarity and sequence homology. [2]
- b) What are nucleotide sequence database? Explain the major nucleotide databases in detail. [5]
- c) Distinguish between PubMed and Pub Med central. [3]

Q7) Answer the following :

- a) Distinguish between EMBL and NCBI. [4]
- b) Explain Dynamic programming. [4]
- c) Write a note on PAM matrices. [2]

Q8) Attempt any one of the following :

- a) What is progressive alignment? Explain how clustal w uses progressive alignment for multiple sequence alignment. [5]
- b) Explain why there is need of Heuristics approach in database sequence search. Explain any one heuristics approach in sequence similarity search. [5]

Total No. of Questions : 08]

SEAT No. :

P2799

[Total No. of Pages : 2

[5024] - 204

M.Sc.

BIOCHEMISTRY

BCH - 273 : Membrane Biochemistry and Genetics

(Credit System) (Semester - II)

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 8 are 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) Describe the protein-lipid interaction in a membrane. [3]
- b) Write note on nuclear pores . [4]
- c) Explain passive permeability of plasma membrane . [3]

Q2) Attempt the following ;

- a) Describe receptor mediated endocytosis . [3]
- b) Write note on membrane associated diseases . [3]
- c) Explain role of Na-k ATP are in membrane permeability . [4]

Q3) Attempt the following :

- a) What are anti-microbial agents? Give examples . [2]
- b) Describe ligand gated channels with a suitable example . [3]
- c) What is active transport? Explain with example . [5]

P.T.O.

- Q4)** Attempt any one [5]
- a) Give an account of the assembly of a virus membrane receptor .
 - b) Give detailed account of structure & assembly of biological membrane .

SECTION - II

Q5) Attempt the following :

- a) Explain the term conditional mutants with suitable example [3]
- b) What are genetic disorders ? Write note on genetic disorders of gene origin . [4]
- c) Write note on Tetrad Analysis - a specialised genetic system of fungi [3]

Q6) Attempt the following :

- a) Explain the semi-conservative mechanism of replication . [4]
- b) What is fertility factor . [2]
- c) Describe structure of Z-DNA . [4]

Q7) Attempt the following :

- a) What was the concept of gene as described by Benzer. [3]
- b) Write note on complementation test with suitable example . [3]
- c) Explain transduction and conjugation . [4]

Q8) Attempt any one [5]

- a) The DNA is a double helix . Explain .
- b) Give detailed account of various kinds of vectors .

Total No. of Questions : 06]

SEAT No. :

P2800

[Total No. of Pages :2

[5024] - 301

M.Sc. (Biochemistry) (Semester - III)

BCH - 370 : Molecular Biology

(Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.*
- 2) Figures to 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) Explain two difference in between transcription and replication [2]
- b) Write note on Retrotranposons. [3]
- c) Explain role of DNA polymerase in replication. [2]
- d) Give the role of Rec B in recombination [3]

Q2) Answer the following

- a) Define charging of t-RNA. [3]
- b) Differentiate between eukaryotic and prokaryotic translation of protein [3]
- c) Write in brief about Ames test and its use [4]

P.T.O.

Q3) Answer the following

- a) Write note on splicing. [3]
- b) Justify t-RNA are adapter molecules? [3]
- c) Explain mechanism of non composite transposition [4]

Q4) Answer the following

- a) Explain pyrimidine dimer formation [2]
- b) Write in brief about need for RNA editing. [3]
- c) What is replication fork? [2]
- d) Write note on mismatch repair mechanism? [3]

Q5) Attempt any two

- a) Write note on inhibitors of protein synthesis. [5]
- b) Write note on chromatin remodeling [5]
- c) Explain Eukaryotic replication mechanism [5]

Q6) Attempt any two

- a) Explain protein targeting to nucleus [5]
- b) Give need for splicing and explain alternative splicing. [5]
- c) Write note on retroviruses [5]

Total No. of Questions : 08]

SEAT No. :

P2801

[Total No. of Pages : 3

[5024] - 302

M.Sc. (Semester - III)

BIOCHEMISTRY

BCH - 371 : Medical Biochemistry and Immunology

(2013 Pattern) (Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer any two questions from question No: 1-3 and any two questions from question No: 5-7.*
- 2) *Question No: 4 and 8 are compulsory.*
- 3) *Answer each section on separate answer sheets*

SECTION - I

Medical Biochemistry

Q1) Answer the following.

- a) Describe in short dementia [2]
- b) Write an account on hemoglobinopathies with respect to thalassemias.[4]
- c) Enlist the causative agents of cancer and role of viruses in carcinogenesis [4]

Q2) Attempt the following :

- a) Explain hallucinogen [2]
- b) Explain the structure and function of lysosomes in animal and plant cells [4]
- c) Describe how the antibiotics inhibit protein synthesis with example. [4]

P.T.O.

Q3) Answer the following :

- a) What do you mean by antimetabolites? [2]
- b) What is lysosomal storage disease explain? [4]
- c) Explain the mechanism of action of antifungal and antiprotozoal. [4]

Q4) Attempt any one of the following

- a) Explain biochemistry of coronary heart disease. [5]
- b) Explain α - thalassemias pathophysiology.

SECTION - II

Immunology

Q5) Answer the following

- a) Explain types of Blood group [2]
- b) Explain in detail structural features of IgG. [3]
- c) Elaborate the steps involved in the production of monoclonal antibodies. [5]

Q6) Attempt the following

- a) Differentiate between cell mediated immunity and humoral immunity [2]
- b) List out the primary lymphoid organ and explain any one of the following. [3]
- c) Explain the principle, procedure and application of ELISA techniques. [5]

Q7) Answer the following

- a) Explain the principle of vaccination. [2]
- b) What are immunodeficiency diseases ? Discuss the features of one such disease. [3]
- c) Compare the complement activation events of the classical pathway with those of alternate pathway. [5]

Q8) Answer any one of the following

[5]

- a) Where do T cells and B cells mature in the body . How are they Responsible for desired immune response of the host system?
- b) Why are antibody termed as immunoglobulins? List out the different class of immunoglobulins and write on their function in the body.

Total No. of Questions : 8]

SEAT No. :

P4950

[Total No. of Pages : 2

[5024] - 303

M.Sc.

BIOCHEMISTRY

**BCH - 372 : Neurochemistry and Biochemistry of Specialized Tissues
(Credit System)**

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

Neurochemistry

Q1) Answer the following :

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

Q2) Attempt the following :

- a) What are the function of cell body and dendrites of nerve cell? [3]
- b) Explain the functions of hypothalamus [3]
- c) Describe the functional and structural difference between autonomic nervous system and somatic nervous system. [4]

Q3) Attempt the following :

- a) Write a note on reuptake of neurotransmitters with example. [2]
- b) Describe the functions of ganglia. [3]
- c) Describe the role of 'cAMP, Ca²⁺, Protein Kinase in memory. [5]

P.T.O.

- Q4)** Attempt any one of the following : **[5]**
- a) Explain the role of nitrous oxide in nervous system.
 - b) Write a note on blood brain barrier.

SECTION - II

Biochemistry of Specialized Tissues

- Q5)** Answer the following :
- a) What is synapse? **[2]**
 - b) Explain the role of rhodopsin. **[4]**
 - c) Describe the physiology of hearing. **[4]**
- Q6)** Answer the following :
- a) What are acetylcholine receptors? **[3]**
 - b) Explain the biochemistry of taste? **[3]**
 - c) Describe the role of kinesin. **[4]**
- Q7)** Answer the following :
- a) What is axoneme? **[2]**
 - b) Explain the role of rod and cone cells of retina. **[3]**
 - c) Describe the ATPase cycle of myosin. **[5]**
- Q8)** Attempt any one of the following : **[5]**
- a) What are the receptors involved in the perception of smell? Explain their sensitivity and selectivity.
 - b) Describe the location, function and mechanism of acetylcholine esterase.



Total No. of Questions : 8]

P2802

SEAT No. :

[Total No. of Pages : 2

[5024]-304

M.Sc.

BIOCHEMISTRY

BCH - 373 : Toxicology and Plant Biochemistry

(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 50

Instruction :

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

SECTION - I

Toxicology

Q1) Answer the following :

- a) Classify the toxic agents [3]
- b) Explain AIMS Test. [4]
- c) Write a note on Teratology and, reproduction [3]

Q2) Answer the following :

- a) Explain local verses systemic toxicity [4]
- b) Explain phasc I and phase II biotransformation reaction [4]
- c) Give the principle of Toxicology [2]

Q3) Answer the following :

- a) What are animal and,plant toxins [3]
- b) Write a note on chlorinated insecticids metals [3]
- c) Explain allergic and ideosyncratic reaction [4]

P.T.O.

Q4) Answer any one of the following:

- a) Explain the applications of toxicology [5]
- b) What is the difference between acute sub, acute, chronic and sub chronic toxicity. Explain. [5]

SECTION - II

Q5) Answer the following :

- a) Write note on seed storage protein and give their role [3]
- b) Describe role of phosphorous in plant growth and development. [4]
- c) What are hormones ? Give role in senescence and abscission. [3]

Q6) Answer the following :

- a) Enumerate plant pest types and one system each of their infection [2]
- b) Give account of chemistry of phenolics and add note on their application [5]
- c) Write note on nitrogen transformation during development [3]

Q7) Answer the following :

- a) Write account of assimilation of sulphate [3]
- b) Describe cyclic phosphorylation/ c_3 [3]
- c) Give role of auxin in plant growth and development [4]

Q8) Answer any one : [5]

- a) Describe in detail light reaction of photosynthesis.
- b) Give an account of nitrogen cycle and add a note on assimilation of NH_4^+ ions



Total No. of Questions : 08]

SEAT No. :

P2803

[Total No. of Pages : 3

[5024] - 401

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

SECTION - I

PHYSIOLOGICAL BIOCHEMISTRY

Q1) Answer the following.

- a) Write any two physiological function of liver . [3]
- b) Explain any three liver function tests . [3]
- c) What are pancreatic acini? How do their functions differ from those of the pancreatic islets ? [4]

Q2) Attempt the following ;

- a) How do cortical nephrons and juxtramedullary nephrons differ structurally ? [2]
- b) Write a note on Jaundice and its types. [4]
- c) Explain intrinsic and extrinsic pathway. [4]

P.T.O.

Q3) Answer the following :

- a) How is glomerular filtration rate regulated ? [3]
- b) What are the functions of gastric lipase and lingual lipase in the stomach ? [3]
- c) Describe the functions of the stomach ? [4]

Q4) Attempt any one of the following :

- a) What are the principle physiological effects of acidosis and alkalosis? [5]
- b) Explain the functions of pancreatic amylase, aminopeptidase, gastric lipase and deoxyribonuclease . [5]

SECTION - II

(ENDOCRINOLOGY)

Q5) Answer the following :

- a) Write a short note on target cell . [2]
- b) Why group-I hormones have long half-life period as compared to group-II hormones ? [4]
- c) Explain the hormonal inter-relationship with example . [4]

Q6) Attempt the following :

- a) What is the function of tyroperoxidase ? [2]
- b) Write a note on disorders of thyroid gland . [3]
- c) Describe the component of adenyl cyclase system . [5]

Q7) Answer the following :

- a) Explain the role of insulin in carbohydrate metabolism. [3]
- b) What are enkephalins ? Explain their physiological role . [3]
- c) Write a note on steroid-thyroid hormone receptor superfamily . [4]

Q8) Attempt any one of following :

- a) What are hormones? Differentiate on the basis of mode of action in details . [5]
- b) Describe the role of Renin-Angiotensin system in adrenal steroid production and secretion . [5]

Total No. of Questions : 08]

SEAT No. :

P2804

[Total No. of Pages : 3

[5024] - 402

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) *Answer to both the sections should be written in separate answer sheets.*
- 2) *Question No. 4 and Q No. 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 right indicate full marks*

SECTION - I

Q1) Answer the following :

- a) What is meant by effluent treatment . [2]
- b) What are different methods of preservation of industrially important micro-organism? [4]
- c) Which culture technique you think is best in fermentation explain? [4]

Q2) Attempt the following :

- a) What is the relationship between batch culture and fed batch culture?[2]
- b) Give the different methods for strain improvement. [4]
- c) Write a note on development of inoculum for yeast process. [4]

P.T.O.

Q3) Answer the following :

- a) What is media sterilization mean? [2]
- b) Explain the design of fermenter with diagram . [5]
- c) How centrifugation is useful for product recovery? [3]

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

- a) What should be specific characteristics for industrially important micro-organism?
- b) What are the various methods of feedback control?

SECTION-II

Q5) Answer the following :

- a) What are cybrids and hybrids? [3]
- b) How to establish anther culture. Explain its importance in plant tissue culture. [3]
- c) Write a brief note on composition of animal tissue media . [4]

Q6) Answer the following :

- a) Explain in brief 'Heterokaryon' . [3]
- b) How to establish 'clones'. How it is beneficial to animal tissue culture [3]
- c) How to establish agrobacterium mediated hairy root culture in tissue culture . [4]

Q7) Answer the following :

- a) What is protoplast? Explain detail methodologies for protoplast fusion. **[3]**
- b) Why antibiotics are used in animal tissue culture? Explain any two with example . **[3]**
- c) What is somaclonal variation? What are possible changes observed after variation? Explain its application and limitations . **[4]**

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

- a) Explain various types of aseptic techniques used in plant tissue culture.
- b) Explain
 - i) Sub culture of primary cell culture .
 - ii) Disadvantages of serum .

Total No. of Questions : 08]

SEAT No. :

P2805

[Total No. of Pages : 2

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M.Sc.

BIOCHEMISTRY

BCH - 472 : Genetic Engineering

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat labeled diagrams must be drawn wherever necessary.*
- 2) *Solve section - I and section - II an separate answer book.*
- 3) *Solve any two questions from Q1 to Q3 and any two from Q5 to Q7. Question No. 4 and Q No. 8 are compulsory.*
- 4) *Figures to the right indicate full marks*

SECTION - I

Q1) Answer the following.

- a) What is transformation ? [2]
- b) Write note on cloning vectors for yeast . [4]
- c) Explain process of southern blotting . [4]

Q2) Answer the following ;

- a) What is role of lac Z gene in gene cloning [2]
- b) Write a note on types of reastriction enzymes . [4]
- c) Write note on S1 nuclease mapping . [4]

Q3) Answer the following :

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

P.T.O.

Q4) Explain the detail.

- a) Explain dideoxy method of DNA sequencing . [5]

OR

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

SECTION-II

Q5) Answer the following :

- a) What is mi RNA . [2]
b) Write note on RFLP and its applications . [4]
c) Describe production of insect resistance transgenic plants . [4]

Q6) Answer the following :

- a) Give any two examples of recombinant hormones . [2]
b) Explain agrobacterium mediated gene transfer. [4]
c) Give the applications of RNA i technology . [4]

Q7) Answer the following :

- a) What are proteomes ? [2]
b) List the various variations of PCR procedure and explain any one in detail . [4]
c) Explain in vitro mutagenesis . [4]

Q8) Explain the detail.

- a) Explain the applications of genetic engineering in medicine and agriculture . [5]

OR

- b) Discuss the methods used to transfer in animal cells . [5]

Total No. of Questions : 08]

SEAT No. :

P2806

[Total No. of Pages : 2

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M.Sc.

BIOCHEMISTRY (Optional)

BCH - 473 : Clinical Nutrition and Food Technology

(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 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 right indicate full marks.*

SECTION - I

(CLINICAL NUTRITION)

Q1) Answer the following :

- a) Enlist the organ affected by alcohol consumption . [2]
- b) Explain infant and geriatric nutrition . [3]
- c) Describe the factors affecting on absorption of food . [5]

Q2) Answer the following :

- a) What is inborn error metabolism? [2]
- b) What is the effect of food quality on mental development? [3]
- c) Explain physiological effects and metabolic adaptation during exercise. [5]

Q3) Answer the following :

- a) Explain the effect of cooling on nutritional quality of food. [3]
- b) What is food toxin? Give the adverse effect of alcohol. [5]
- c) What is effect of fermentation on nutritional quality of food. [2]

P.T.O.

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

- a) Give the relationship between diet and nutrition. How will you do the assessment of nutritional states.
- b) Describe the interrelationship between dietary lipids and cholesterol metabolism .

SECTION-II

(FOOD TECHNOLOGY)

Q5) Answer the following :

- a) Enlist the food obtained from plant origin . [2]
- b) Explain the process of monitoring the quality of food . [4]
- c) Write a note on primary feed stock and SCP. [4]

Q6) Answer the following :

- a) What is the difference between natural and synthetic sweetness and syrups . [4]
- b) Enlist the starch production method. [2]
- c) Give the role of enzymes in food analysis. [4]

Q7) Answer the following :

- a) Write a note on meat tenderization. [2]
- b) Explain the role of enzyme in food processing. [4]
- c) Give the change in the biochemistry of fresh and spoiled food . [4]

Q8) Answer any one of following : [5]

- a) Explain different food additives used as a flavoring agent , sweetness and colour in food industry.
- b) How will you analyse the natural food from genetically modified food .
