Total No. of Questions : 8]

SEAT No. :

P2049

[Total No. of Pages : 2

[4924]-101

M.Sc. (Semester - I)

BIOCHEMISTRY

BCH - 170 Biomolecules

(Credit System)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Question Nos. 4 and 8 are compulsory. Out of the remaning attempt 2 questions from section I and 2 questions from section II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***All questions carry equal marks.***

SECTION - I

Q1) Answer the following:

a) Write a note on amino sugars. Give their significance. **[3]**

b) Give the reaction of sugar with Bromine water and Ion. HNO_3 (nitric acid). **[3]**

c) Write a note on storage polysaceharides. **[4]**

Q2) Answer the following:

a) What are reducing sugars? Give an example. **[2]**

b) Give the structure and function of triacylglycerol. **[3]**

c) Give the structure, biological function and deficiency of niacin. **[5]**

Q3) Answer the following:

a) What is a glycosidic bond? **[2]**

b) Give the properties of water that make it a universal solvent. **[4]**

c) What are phospholipids? How are they classified? **[4]**

P.T.O.

Q4) Answer any one:

a) Classify monosaccharides on the basis of their carbon number. Give examples. **[5]**

b) Give the biological significance of lipids. **[5]**

SECTION - II

Q5) Answer the following:

a) Write a note on β-sheets of proteins. **[3]**

b) Write a note on modified amino acids with suitable examples. **[3]**

c) Describe any two supersecondary structures of proteins. **[4]**

Q6) Answer the following:

a) Draw the structure of any two neutral amino acids. **[2]**

b) Describe any one method of protein sequencing. **[4]**

c) A peptide bond is rigid and planar. Justify. **[4]**

Q7) Answer the following:

a) Define isoelectric point. **[2]**

b) Give the significance of Ramchandran plot. **[3]**

c) Describe quaternary structure of protein writh haemoglobin as an example. **[5]**

Q8) Answer any one:

a) Describe the non-covalent interaction that stabilise the protein structure. **[5]**

b) Give the classification of proteins with suitable examples. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2050

[Total No. of Pages : 2

[4924]-102

M.Sc. (Semester - I)

BIOCHEMISTRY

BCH - 171 : Enzymology and Biophysical Techniques

(Credit System)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

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

SECTION - I
(Enzymology)

Q1) Answer the following:

a) What do you understand by term 'apoenzyme' and 'coenzyme'? **[2]**

b) Define and explain the "proximity effect" in enzyme catalysis. **[4]**

c) What is the significance of Hill constant in kinetics of allosteric enzyme? **[4]**

Q2) Attempt the following:

a) How the rate of degradation (Kd) of the enzyme is measured? **[3]**

b) Why does the activity of enzymes vary with pH? **[3]**

c) What is covalent catalysis? Explain with example. **[4]**

Q3) Answer the following:

a) What is the use of ubiquitin cycle? **[2]**

b) Explain in detail enzyme sepecificity? **[3]**

c) Derive Michaelis-Menten equation. Add a note on the significance of Km value. **[5]**

P.T.O.

Q4) Attempt any one of the following:

a) What is the significance of allosteric and cooperative behavior of an enzyme? **[5]**

b) Explain in detail the role of the three amino acid residues in the catalytic triad of chymotrypsin. **[5]**

SECTION - II
(Biophysical Techniques)

Q5) Answer the following:

a) List two (2) support mediums, other than cellulose acetate, that have been used in moving boundary electrophoresis. **[2]**

b) What is the basis for the separation of different compounds by ion exchange? **[4]**

c) Why is 2D PAGE-gel electrophoresis important in proteomics study? **[4]**

Q6) Attempt the following:

a) Give the principle of isoelectric focusing. **[3]**

b) Write short note on hydrophobic chromatography. **[3]**

c) Explain the difference between qualitative and quantitative measurements in spectroscopy. **[4]**

Q7) Answer the following:

a) Give the principle of metal chelate chromatography. **[2]**

b) Explain the procedure to separate DNA fragments by agarose gel eletrophoresis. **[3]**

c) What is dialysis? Give the significance of the technique. **[5]**

Q8) Attempt any one of the following:

a) Describe any two applications of molecular sieve chromatography. **[5]**

b) Explain different methods used for the extraction of enzymes. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2051

[Total No. of Pages : 2

[4924] - 103
M.Sc. (Semester - I)
BIOCHEMISTRY
BCH - 172: Microbiology And Cell Biology
(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 No.4 and 8 are compulsory.***
3) ***Attempt any two question from Q.1 to Q.3 and two from Q.5 to Q.7.***
4) ***Figures to the right indicate full marks.***

SECTION - I

(Microbiology)

Q1) Answer the following.

a) Explain Robert roch postulates. **[3]**

b) Give the mode of action of alcohol . **[3]**

c) Explain phase contrast microscope. **[4]**

Q2) Answer the following.

a) Explain nitrate reductase system. **[3]**

b) Give the process of steam specilization. **[3]**

c) Enlist chemical agents used for control of micro-organism. Add a note on mode of action of heavy metal. **[4]**

Q3) Answer the following.

a) What is meant by flagella. Explain the structure and arrangement of flagella. **[3]**

b) How dyes and synthetic detergents control the growth of micro-organism. **[3]**

c) Write about bacterial endotoxin and exotoxin. **[4]**

P.T.O.

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

a) Explain in detail plant and animal viruses.

b) Explain the methods of preservation of bacterial culture.

SECTION - II

(Cell Biology)

Q5) Answer the following.

a) Give the functions of plant cell wall. **[2]**

b) Give the salient features of animal cell. **[4]**

c) Describe any one specific staining method of mitochondria along with marker enzyme. **[4]**

Q6) Answer the following.

a) What is biochemical composition of plasma membrane? **[2]**

b) Explain structure & role of endoplasmic reteculum. **[3]**

c) Write a note on cell-cell recognition in plants. **[5]**

Q7) Answer the following.

a) What is density gradient centrifugation ? **[2]**

b) With the help of suitable diagram explain the detail structure of animal cell. **[4]**

c) Explain the structure & biochemical composition of mitochondria. **[4]**

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

a) Describe in detail process of mitosis.

b) What is differential centrifugation? Describe in detail how it is used is separation of different cell organelles.

Total No. of Questions : 8]

SEAT No. :

P2052

[Total No. of Pages : 2

[4924] - 201
M.Sc. (Semester - II)
BIOCHEMISTRY
BCH - 270: BIOENERGETICS AND METABOLISM
(Credit System)

Time :3. Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***Answer to both sections should be written on seperate sheets.***
2) ***Question No.4 and Q.No.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) Give the significance of gluconeogenesis. **[3]**

b) Write note on structure and significance of ATP. **[4]**

c) Give the energetics of glycolysis. **[3]**

Q2) Attempt the following.

a) Discuss process of oxidative phosphorylation. **[4]**

b) Explain triacylglycerol biosynthesis. **[3]**

c) Write note on ketone bodies. **[3]**

Q3) Attempt the following.

a) How glycogen synthesis and breakdawm are reciprocally regulated? **[4]**

b) Discuss the role of uncouplers and inhibitors in ETC. **[3]**

c) Write note on high energy compounds. **[3]**

Q4) Attempt any one.

a) Explain pentose phosphate pathway in detail. **[5]**

b) Explain pyruvate dehydrogenase multienzyme complex. **[5]**

P.T.O.

SECTION - II

Q5) Attempt the following.

a) Write note on transamination reaction. **[3]**

b) Give an account of biosynthesis of any one aromatic amino acid. **[3]**

c) Write a short note on inborn errors of amino acid metabolism. **[4]**

Q6) Attempt the following.

a) Describe salvage pathway of purines. **[4]**

b) What is decarboxylation of aminoacids? Give its significance. **[3]**

c) What are polyamines? **[3]**

Q7) Attempt the following.

a) Write note on glutathione. **[4]**

b) How ammonia is toxic to brain? How it is transported from brain to liver. **[3]**

c) How glycine is synthesized in mammals? **[3]**

Q8) Attempt any one.

a) Write a pathway involved in biosynthesis of purine. **[5]**

b) Elaborate in detail urea cycle. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2053

[Total No. of Pages : 2

[4924] - 202
M.Sc.
BIOCHEMISTRY
BCH - 271: TECHNIQUES IN CHARACTERIZATION OF BIOMOLECULES
(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 Q1 to Q3 and two questions from Q5 to Q7.***
4) ***Figures to the right indicate full marks.***

SECTION - I

(Biophysical Methods)

Q1) Answer the following.

a) What is zonal centrifugation? **[2]**

b) Write a note on X - ray diffraction. **[4]**

c) Enlist the factors governing choice of isotope. Explain any one. **[4]**

Q2) Attempt the following.

a) Write a note on radiolysis of water. **[3]**

b) How molecular weight is determined by sedimentation equilibrium? **[3]**

c) Define sedimentation coefficient and ultracentrifugation. Derive an expression for sedimentation. **[4]**

Q3) Answer the following.

a) Enlist the factors affecting sedimentation velocity. **[2]**

b) With the help of viscometry, how will you prove that certain substances can intercalate between nucleotide bases of DNA. **[3]**

c) Describe the theory of partial specific volume & diffusion. **[5]**

P.T.O.

Q4) Attempt any one of the following. **[5]**

a) Write a note on atomic absorption spectroscopy.

b) Discuss the factors that affect the resolution of autoradiography.

SECTION - II

(Structure Determination of Biomolecules)

Q5) Answer the following.

a) What is ESR? Give its principle. **[2]**

b) Write a note on MALDI - TOF - MS. **[3]**

c) Name the 2 major or component of biosensors How will you differentiate the generation of biosensors on the basis of these two component and of redox reaction. **[5]**

Q6) Attempt the following.

a) Give the instrumentation of GCMS. **[2]**

b) What is the use fulness of fluorescence in biochemistry give the principle and application of fluorescence. **[4]**

c) Draw the schematic diagram of NMR and explain the instrumentation. **[4]**

Q7) Answer the following.

a) Write a note on ORD and CD. **[4]**

b) Give the principle and application of IRspectroscopy. **[4]**

c) Name the transducer system which is suitable for development of urea biosensor and why? **[2]**

Q8) Attempt any one of the following.

a) Explain in detail the principle instrumentation and application of LLMS. **[5]**

b) Name the different matrix used in MALDI. Give the principle and application of MALDI - MS. **[5]**

Total No. of Questions : 8]

SEAT No. : ____

P2054

[Total No. of Pages : 3

[4924] - 203
M.Sc. (Semester - II)
BIOCHEMISTRY
BCH - 272: BIOSTATISTICS, COMPUTER AND BIOINFORMATICS
(2013 Pattern) (Credit System)

Time :3 Hours] ***[Max. Marks :50***

Instructions to the candidates:

1) ***Answer to both the sections should be written on sepaate answer sheets.***
2) ***Question No.4 and 8 are compulsory.***
3) ***Attempt any two questions from Q1 to Q3 and any two from Q5 to Q7.***
4) ***Figures to the right indicate full marks.***
5) ***Supplementary will be provided for checking p values.***
6) ***Graph papers will be provided.***

SECTION - I

(Biostatistics and computer)

Q1) Answer the following.

a) The frequency distribution of member of seeds per plants is given below. Find the value of mode of this distribution. Represent it graphically **[3]**

No. of seeds Per plants	20-30	30-40	40-50	50-60	60-70	70-80
No. of plants	10	18	37	45	27	15

b) In a grassland the earthworm population was sampled from eight randomly located quadrates of cm^2 area. Test whether earthworm population in distributes equally or not from the data by chi square test. **[4]**

Quadrates	1	2	3	4	5	6	7	8
Earthworm No/m^2	12	17	13	21	16	15	13	14

c) What is a program ? What are steps involved in the program? **[3]**

P.T.O.

Q2) Answer the following

a) Sketch a general layout of FORTON program. **[2]**

b) From the following data of the weight of 125 students determine the nodal weight. **[4]**

Weight (ltrs)	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No.of Student	4	12	31	43	5	2	1	9

c) In an ecological study, data reorded in fresh and dry weights for a sample of an experimental material calculate the correlation coefficient between the two categories and find out its level of significance. **[4]**

Fresh weight (gms)	6	10	12	4	15	12	14	8	7	5
No. of grains	3	3	4	1	5	3	3	2	2	2

Q3) Answer the following.

a) Explain meaning of the following programing statements If (Number L.T. Minimum) minimum = Number. **[2]**

b) Draw a histogram frequency polygon and cumulative frequency curve (ogive) for number of grains per spins. **[4]**

No. of grains	17-19	20-22	23-25	26-28	29-31	32-34	35-37
No.of plants	8	15	18	21	26	19	12

c) Calculate the median from the following data. **[4]**

No.of spins Per particle	50-60	60-70	70-80	80-90	90-100	100-110	110-120
No. of branches	5	13	17	25	29	22	17

Q4) Answer any one of the following.

a) What are arithmetic operations? Explain with help of operator and operation in details. **[5]**

b) The data recorded on 100- seed weight (gms) of a green gram variety (ps -16) are given below.

100 seed weight (grm) = 3.1, 3.2 ,3.4,3.5,3.6,3.8,4.0,4.1 Calculate. **[5]**

i) Mean

ii) Variance

iii) Standard deviation

iv) Coefficient of variation.

SECTION - II

(Bioinformatics)

Q5) Answer the following.

a) What is Bioinformatics and how does it differ from computational biology. **[3]**

b) Write a note on gap penalty. **[3]**

c) Which approach of sequence alignment you will use if two sequence are very similar global or local? why. **[4]**

Q6) Attempt the following.

a) What is the significance of sequence alignment. **[3]**

b) What in jmol? Write the significance of protein structure visualization tools. **[4]**

c) What are structural datahouse? Write a note on PDB. **[3]**

Q7) Answer the following.

a) What are PAM Matrices **[2]**

b) What do you mean by progressive alignment? Explain how clustal ω uses progressive alignment for multiple sequence alignment. **[4]**

c) Write a note on blastn, blastp and blastx tools available at NCBI website. **[4]**

Q8) Answer any one of the following.

a) What are the merits of multiple sequence alignment (MSA) over the pair wise sequence alignment? Explain the usefulness of cluster ω in MSA. **[5]**

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 considered highly insignificant a highly significant? Why? **[5]**

Total No. of Questions : 8]

SEAT No. :

P2055

[Total No. of Pages : 2

[4924] - 204
M.Sc. (Semester - II)
BIOCHEMISTRY
BCH - 273: MEMBRANE BIOCHEMISTRY AND GENETICS
(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 No.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) Describe various constituents of biological membranes. **[4]**

b) Write note on passive diffusion. **[3]**

c) Describe briefly assembly of virus receptor. **[3]**

Q2) Attempt the following.

a) Write note on gap functions. **[3]**

b) Describe various factors affecting physical properties of membrane. **[4]**

c) Explain exocytosis. **[3]**

Q3) Attempt the following.

a) What are ionophores. **[2]**

b) Write an account on voltage gated channels. **[5]**

c) Describe role of liposomes in drug delivery. **[3]**

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

a) Give detailed account of biological membrane.

b) Explain membrane transport in detail.

P.T.O.

SECTION - II

Q5) Attempt the following.

a) Describe semi-conservative mechanism of replication. **[4]**

b) Write note on Auxotroph. Give suitable example. **[3]**

c) Distinguish between genotype and phenotype. **[3]**

Q6) Attempt the following.

a) What is denaturation of DNA? What is Tm? **[3]**

b) Write note on conjugation. **[3]**

c) Explain tetrad analysis. **[4]**

Q7) Attempt the following.

a) What is conditional mutant? Give one example. **[3]**

b) Describe the operon with a suitable example. **[3]**

c) Describe A and B forms of DNA. **[4]**

Q8) Attempt any one.

a) Give detailed account of double helix structure of DNA. **[5]**

b) Describe in detail mendelian law of heridity. **[5]**

Total No. of Questions : 6]

SEAT No. :

P2056

[Total No. of Pages : 2

[4924] - 301
M.Sc. (Semester - III)
BIO-CHEMISTRY
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 the right side indicate full marks.***
3) ***Solve any three questions from Q1 to Q4.***
4) ***Questions 5 and 6 are compulsory.***

Q1) Answer the following.

a) Explain mobile genetic elements with example. **[2]**

b) Explain prokaryotic RNA polymerase. **[3]**

c) Give two major differences in transcription and replication. **[2]**

d) What is the role of snRNAs & spliceosome? **[3]**

Q2) Answer the following.

a) Explain Holliday junction model. **[3]**

b) Give the role of helicase and ligase in DNA replication. **[3]**

c) Proteins are modified before targeting or transportation. Explain. **[4]**

Q3) Answer the following.

a) Explain pyrimidine dimer formation. **[3]**

b) Explain role of t-RNA in translation. **[3]**

c) Explain steps in homologous recombination in which Rec A participates. **[4]**

Q4) Answer the following.

a) What are adenoviruses? **[2]**

b) Explain mismatch repair mechanism **[3]**

c) What are ribozymes? **[2]**

d) Explain transposable elements in bacteria. **[3]**

P.T.O.

Q5) Attempt any 2

a) Explain Rho-dependent and Rho-independent termination. **[5]**

b) Give the post translational modification of t-RNA, m-RNA and r-RNA. **[5]**

c) Explain retrotransposons and their method of transposition. **[5]**

Q6) Attempt any 2

a) Justify prokaryotic transcription and translation are coupled. **[5]**

b) Explain mitochondrial protein transport. **[5]**

c) Explain chromatin remodeling in brief. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2057

[Total No. of Pages : 2

[4924] - 302
M.Sc. (Semester - III)
BIOCHEMISTRY
BCH - 371: MEDICAL BIOCHEMISTRY & IMMUNOLOGY
(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 indicate full marks.***
3) ***Solve <u>any two</u> questions from each sections.***
4) ***Questions Q.No 4 and Q.No 8 is compulsory.***

SECTION - A
(Medical Biochemistry)

Q1) Answer the following.

a) What are antibodies. **[2]**

b) What is role of lysosome in plant cell. **[4]**

c) Explain causes of sickle cell anemia. **[4]**

Q2) Answer the following.

a) What is meant by CHD. **[2]**

b) Explain what is carcinogenesis. **[4]**

c) What is meant by haemoglobinopathics. **[4]**

Q3) Answer the following.

a) What are hallucinogens. **[2]**

b) Explain mechanism of resistance to antibiotic. **[4]**

c) Write any one lysasomal pathology disorder. **[4]**

Q4) Explain in detail.

a) Mechanism of action of antimetabolites. **[5]**

OR

b) Give molecular genetics of cancer. **[5]**

P.T.O.

SECTION - B

(Immunology)

Q5) Answer the following.

a) What are haptens? Explain giving examples. **[2]**

b) Explain Monoclonal antibodies. **[4]**

c) Explain attenuated vaccines. **[4]**

Q6) Answer the following.

a) What is epitope? **[2]**

b) Explain structure of Ig molecule. **[4]**

c) Explain Humoral immunity. **[4]**

Q7) Answer the following.

a) Explain abzymes. **[2]**

b) Give different classes of antibodies with one function of each. **[4]**

c) Explain MHC gene complex. **[4]**

Q8) Explain in detail.

a) Explain Clonal selection theory of antibody production. **[5]**

OR

b) Explain immunoelectrophoresis. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2058

[Total No. of Pages : 2

[4924] - 303
M.Sc. (Semester - III)
BIOCHEMISTRY
BCH - 372: Neurochemistry and Biochemistry of Specialized Tissues
(2013 Pattern) (Credit System)

Time :3. Hours] *[Max. Marks :50*

Instructions to the candidates:

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

SECTION - I
(Neurochemistry)

Q1) Answer the following.

a) Which is the brain region responsible for the regulation of breathing and blood pressure? **[2]**

b) What is calpain? Explain the role of calpain and other proteins in memory and learning process. **[4]**

c) Describe the functions of diverging, converging, reverberating, and parallel after- discharge circuits. **[4]**

Q2) Attempt the following.

a) Which is the brain region that receives conscious sensory information? Explain the process in brief. **[3]**

b) What roles do the dendrites, cell body, and axon play in communication of signals? **[3]**

c) Describe the different ways to classify sensory receptors. **[4]**

Q3) Answer the following.

a) What is meant by the arch reflex? **[2]**

b) List the functions of the reticular formation. **[3]**

c) Describe the synthesis, storage, uptake, degradation and action of any one neurotransmitter. **[5]**

P.T.O.

Q4) Attempt any one the following.

a) Describe the organization of the nervous system. **[5]**

b) Describe the role of biomolecules involved in circadian rhythms. **[5]**

SECTION - II

(Biochemistry of Specialized Tissues)

Q5) Answer the following.

a) Why does skeletal muscle appear striated when viewed through a microscope? **[2]**

b) Write a short note on taste buds. **[4]**

c) What is the mechanism by which the neural impulse is transmitted along the axon? **[4]**

Q6) Attempt the following.

a) How Ca^{2+}, tropomyosim and troponin regulate the interaction between actin and myosin? **[3]**

b) List the three layers of the eye and the main functions of each layer. **[3]**

c) Describe the strucuture, properties and function of microtubule. **[4]**

Q7) Answer the following.

a) What is resting potential? **[2]**

b) How does the motion of the hair bundle create a change in membrane potential? **[3]**

c) Discuss in brief the action of G-protein. How does it couple the singal between Rhodopsin and adenylate cyclase? **[5]**

Q8) Attempt any one the following.

a) Describe the sequence of events in which a molecule that comes in contract with mucus of the epithelium initiates an action potential. **[5]**

b) Describe briefly major aspects of the structure, properties, locations and functions of each of the following proteins of skeletal muscle actin, myosin, titin, nebulin and actinin. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2059

[Total No. of Pages : 2

[4924] - 304
M.Sc. (Semester - III)
BIOCHEMISTRY
BCH - 373: TOXICOLOGY AND PLANT BIOCHEMISTRY
(Credit System)

Time :3 Hours] *[Max. Marks :50*

Instructions to the candidates:

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

SECTION - I
(Toxicology)

Q1) Answer the following.

a) What is cholera toxin? **[2]**

b) What do you mean by poison? How toxicants are classified? **[4]**

c) Animal develops tolerance against the toxicants. Explain with suitable examples. **[4]**

Q2) Attempt the following.

a) What is tetanus toxoid? **[3]**

b) Write a note on allergic reactions. **[3]**

c) Give the factors that affect the metal toxicity. **[4]**

Q3) Answer the following.

a) What is afla toxin? **[2]**

b) What are the toxic effects caused by DDT? **[3]**

c) Compare the inhibition of acetylcholinesterase caused by organophosphorous and carbamate insecticides. **[5]**

Q4) Attempt any one of the following.

a) Differentiate between acute and chronic toxicity with example. **[5]**

b) How does liver react with the xenobiotics. Explain with any one enzyme. **[5]**

P.T.O.

SECTION - II

(Plant Biochemistry)

Q5) a) Write a note on role of calcium in plant growth. **[2]**

b) Explain the localization of photosystem in thylakoid membrane. **[4]**

c) Explain synetriotic nitrogen fixation. **[4]**

Q6) a) Explain the different types of plant harmones and there role in plant growth and development. **[4]**

b) Write a short note on phenolics, alkaloids and lignins. **[3]**

c) Write a note on plant diseases. **[3]**

Q7) a) Explain 2 scheme of photosynthesis. **[5]**

b) Diagramatically explain nitrogen cycle. **[5]**

Q8) Write short note on (Any two) **[5]**

a) CO_2 fixation

b) Function of indole acetic acid.

c) Somatic hybridization.

Total No. of Questions : 8]

SEAT No. :

P2060

[Total No. of Pages : 2

[4924] - 401
M.Sc. (Semester - IV)
BIOCHEMISTRY
BCH - 470: PHYSIOLOGICAL BIOCHEMISTRY AND ENDOCRINOLOGY
(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) ***Solve any two questions from Q. 1 to Q. 3 and any two from Q.5 to Q.7.***
3) ***Question no. 4 and 8 are compulsory.***
4) ***Figures to the right indicate full marks.***

SECTION - I
(Physiological Biochemistry)

Q1) Answer the following.

a) Explain the analomy of kidney. **[3]**

b) Write the physiological function of liver. **[3]**

c) Explain in detail the transport of O_2 and CO_2 in blood. **[4]**

Q2) Attempt the following.

a) Give the structure of digestive tract. **[3]**

b) Explain the blood clotting cascade. **[3]**

c) Explain the transport and excretion of nutrients. **[4]**

Q3) Answer the following.

a) Write a note on Hemorrages. **[3]**

b) Explain the regulation of respiration. **[3]**

c) What are the clinical abnormalities associated with acid base imbalance. **[4]**

Q4) Attempt any one of the following.

a) Explain corbohydrate, fat and protein metabolism in liver. **[5]**

b) Explain kidney function test in detail. **[5]**

P.T.O.

SECTION - II

(Endocrinology)

Q5) Answer the following.

a) What is GnRH? What are its target cell? **[2]**

b) Describe the steps required for production of enkephalin. **[3]**

c) Steroid hormone receptors are targets for drugs. Justify with suitable example. **[5]**

Q6) Attempt the following.

a) What is POMC? Describe the regulation of synthesis of POMC. **[3]**

b) Describe the similarity between PRL and GH. **[3]**

c) What is ACTH? What are its target cells? What happens if ACTH levels increase? **[4]**

Q7) Attempt the following.

a) Explain the role of renin - angiotensin system. **[2]**

b) Describe the regulation of synthesis of thyroid hormones. **[4]**

c) Discuss the current concept of molecular mechanism of action of insulin. **[4]**

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

a) What is target cell insensitivity? Explain with example.

b) Discuss how the negative feedback mechanism helps to maintain proper balances of hormones in the blood.

Total No. of Questions : 8]

SEAT No. :

P2061

[Total No. of Pages : 2

[4924] - 402
M.Sc. (Semester - IV)
BIOCHEMISTRY
BCH - 471: FERMENTATION TECHNOLOGY AND TISSUE CULTURE
(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 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) What are the different methods for preservation of industrially important micro - organism **[3]**

b) How will you proceed for isolation of resistant mutants? **[3]**

c) How are aseptic condition maintained during fermentation? Explain in detail about the design of fermenters. **[4]**

Q2) Attempt the following.

a) Explain the media for industrial fermentation. **[4]**

b) Describe in detail the manufacture of beer by fermentative process. **[4]**

c) Name the different culture methods of micro organism. **[2]**

Q3) Answer the following.

a) Explain the role of chromatography in product recovery. **[3]**

b) Write a note on development of inoculum for bacterial process. **[3]**

c) What are the different types of culture methods explain any one of it. **[4]**

P.T.O.

Q4) Attempt any one of the following.

a) Explain instrumentation and control system in fermentation. **[5]**

b) Explain the application of fermentation technology. **[5]**

SECTION - II

(Tissue Culture)

Q5) Answer the following.

a) Write a note on organ culture. **[3]**

b) Explain the technology of protoplast function. **[3]**

c) Discuss briefly cell and tissue banking. **[4]**

Q6) Attempt the following.

a) What are heterocaryon and variant cells? **[2]**

b) What are primary and established cell lins? **[3]**

c) What are different cell culture method explain. **[5]**

Q7) Answer the following.

a) What do you mean by contact inhibition? **[3]**

b) What are basic requirements of tissue culture laboratory? **[3]**

c) What are different methods of animal cell preservation? **[4]**

Q8) Answer any one of the following.

a) Describe phytochemistry of the metabolites of medicinal plants. **[5]**

b) What are different techniques used in animal tissue culture. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2062

[Total No. of Pages : 2

[4924] - 403
M.Sc. (Semester - IV)
BIOCHEMISTRY
BCH - 472: GENETIC ENGINEERING
(2013 Pattern) (Credit System)

Time :3 Hours] *[Max. Marks :50*

Instructions to the candidates:

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

SECTION - I

Q1) Answer the following.

a) What are shuttle vectors? give one example. **[2]**

b) Write note on genomic library. **[4]**

c) Explain role of ligase in genetic engineering. **[4]**

Q2) Attempt the following.

a) Write note on clone contig method. **[3]**

b) Write short note on PBR 322 vector. **[3]**

c) Explain transfection. **[4]**

Q3) Answer the following.

a) Give the restriction site of Hind III and ECORI. **[2]**

b) Explain principle of southern blottling technique. **[3]**

c) Describe various strategies for selection of cells carrying recombinant vector post transformation. **[5]**

P.T.O.

Q4) Attempt the following.

a) Define vector. Briefly describe various kind of vectors for cloning. **[5]**

OR

b) Describe the strategies to modify blunt end for gene cloning. **[5]**

SECTION - II

Q5) Answer the following.

a) Define protein Engineering? **[2]**

b) Give the principle and applications of PCR. **[4]**

c) Explain method for production of recombinant factor VIII. **[4]**

Q6) Attempt the following.

a) Give the applications of RNA interference technology. **[3]**

b) Describe method for producing insect resistant plant. **[3]**

c) Describe in brief various transfection techniques for animal cells. **[4]**

Q7) Answer the following.

a) Write in short on "genome annotation" **[2]**

b) Give 3 applications of RFLP in forensic science. **[3]**

c) Write note on antisense RNA and its application in plants. **[5]**

Q8) Attempt the following.

a) Explain in detail shot - gun method of sequencing. **[5]**

OR

b) Give applications of protein engineering. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2063

[Total No. of Pages : 2

[4924] - 404
M.Sc. (Semester - IV)
BCH - 473: BIOCHEMISTRY
1) Clinical Nutrition
2) Food Technology
(Credit System)

Time :3. Hours] *[Max. Marks :50*

Instructions to the candidates:

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

Q1) Answer the following.

a) What is the effects of irradiation on nutritional quality of food. **[2]**

b) Describe the interrelationship between dietary lipids and cholestcral metabolism. **[4]**

c) Describe the effect of malnutrition on health. **[4]**

Q2) Attempt the following.

a) What is sprouting? Explain the effect of sprouting on nutritional quality of food. **[3]**

b) Write a note on aminoacid therapy. **[3]**

c) What is the effect of alcohol on health? Explain the effect on neryour system. **[4]**

Q3) Answer the following.

a) Describe the effect of food on mental development. **[2]**

b) Write a note on nutritional basic of behavior. **[3]**

c) Discuss the factors affecting on digestion. Explain any one in brief. **[5]**

P.T.O.

Q4) Attempt any one of the following.

a) What is the nutritional status in India.Explain with example. **[5]**

b) Write a note on Inborn errors of metabolism. **[5]**

(Food Technology)

Q5) Answer the following.

a) What is the difference in food of animal and plant origin. **[3]**

b) What are the different methods for uonitoring food quality. **[3]**

c) Discuss the principle of food presewalism. **[4]**

Q6) Attempt the following.

a) Explain the production of starch. **[3]**

b) Write a note on single cell prolein. **[3]**

c) Explain in detail the manufacturing of natural and synthetic sweehenes. **[4]**

Q7) Answer the following.

a) Write a note on meat lenderisation. **[3]**

b) Discuss the different food additing and flavoring agents. **[4]**

c) What are the different food enzyms used in fecit juice technology.Explain. **[3]**

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

a) What are the different methods for modifying foods geometrically.

b) Explain in detail the enzymes used in food analysis line toxin al cohol etc. **[5]**