Total No. of Questions : 8]

SEAT No. :

P2958

[Total No. of Pages : 2

[5431]-101

M.Sc. (Semester - I)

BIOCHEMISTRY

BCH - 170 : Biomolecules

(2013 Pattern) (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

Biomolecules - I

Q1) **Answer the following.**

a) Give the structure of a steroid, Glycerophospholipid and Sphingolipid. **[3]**

b) Differentiate between reducing and nonreducing sugars. **[3]**

c) Give the source, functions and deficiency disorders of Ascorbic acid. **[4]**

Q2) **Answer the following.**

a) Define acid number and give its significance. **[2]**

b) Classify carbohydrates with suitable examples. **[5]**

c) What are amphipathic lipids? How do they behave in water? **[3]**

Q3) **Answer the following.**

a) Draw the structure of two homodisaccharides. **[2]**

b) Define mutarotation and its significance. **[3]**

c) Discuss the source, functions and deficiency of fat soluble vitamins. **[5]**

P.T.O.

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

a) Explain the reaction basis of Osazone test and Molisch test of Glucose.

b) Discuss the types and significance of lipoproteins.

SECTION - II

Biomolecules - II

Q5) **Answer the following.**

a) Write the structure of two aromatic amino acids. **[2]**

b) List out the factors that stabilise protein structure. **[3]**

c) Explain the titration curve of Glycine and its significance. **[5]**

Q6) **Answer the following.**

a) What are essential amino acids? Give examples. **[2]**

b) Classify proteins based on their function. **[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 chemical synthesis of oligopeptide.

b) Describe the steps involved in amino acid sequencing.

Total No. of Questions : 8]

SEAT No. :

P2959

[Total No. of Pages : 2

[5431]-102

M.Sc. (Semester - I)

BIOCHEMISTRY

BCH - 171 : Enzymology and Biophysical Techniques

(2013 Pattern) (Credit System) (5 Credits)

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

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Question no. 4 and 8 are compulsory.***
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

(Enzymology)

Q1) Answer the following.

a) What are cofactors? Explain with example. **[2]**

b) What is the significance of allosteric and cooperative behavior of an enzyme? **[3]**

c) Write a note on enzyme degradation. **[5]**

Q2) Answer the following.

a) What is the oxyanion hole of chymotrypsin? **[3]**

b) How is chymotrypsinogen converted to chymotrypsin? **[3]**

c) What is the effect of orientation and proximity an enzyme catalyzed reaction? **[4]**

Q3) Answer the following.

a) How to calculate the amount of substrate degraded by enzyme? **[2]**

b) Differentiate between Monod, Wyman, Changeux model and Koshland, Nemethy, Filmer model of enzymes. **[4]**

c) Describe allosteric behavior of phosphofructrokinase. **[4]**

P.T.O.

Q4) Answer any one of the following :

a) What are the types of bisubstrate reaction? How bisubstrate reactions involving ternary complex are differentiated from those not involving ternary complexes? **[5]**

b) Define K_m and V_{max}. How can they be measured? **[5]**

SECTION - II

(Biophysical Techniques)

Q5) Answer the following.

a) How is absorbance related to transmittance? **[2]**

b) Explain any two applications of dialysis. **[3]**

c) Describe the principle and method of HPLC. **[5]**

Q6) Answer the following.

a) What is SDS PAGE? Add a note on its working principles and significance. **[3]**

b) Explain why DNA fragments separate according to size in an electrophoresis gel. **[3]**

c) Describe any two support mediums, other than cellulose acetate, that have been used in moving boundary electrophoresis.. **[4]**

Q7) Answer the following.

a) What is the purification factor? **[2]**

b) Describe any four commercially available matrix-ligand systems for affinity chromatography. **[4]**

c) What is meant by activation and regeneration of an adsorbent? **[4]**

Q8) Answer any one of the following :

a) Write a note on 2D gel electrophoresis. **[5]**

b) How do you calculate the Rf values of separated amino acids in paper chromatography? Give its significance. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2960

[Total No. of Pages : 3

[5431]-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) *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

Microbiology

Q1) **Answer the following.**

a) Give the classification of microorganism with its specific characteristics. **[2]**

b) Explain symbiotic nitrogen fixation. **[3]**

c) Explain the principle working and application of phase contrast microscope. **[5]**

Q2) **Answer the following.**

a) What are pure cultures? **[2]**

b) Explain the nutritional requirement for cultivation of Bacteria. **[5]**

c) What is meant by synchronous growth and continuous growth of microorganisms? Explain. **[3]**

P.T.O.

Q3) **Answer the following.**

a) Enlist different physical and chemical agents used as an antimicrobial agents. **[2]**

b) Why oxygen is toxic to anaerobic bacteria? Add a note on cultivation of anaerobic bacteria. **[4]**

c) Explain in detail electron microscopy for studing microorganism with its limitations. **[4]**

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

a) Explain the viruses of plants, animals and bacteria.

b) Define Auto trophs, heterotrophs, Lithotrophs, Phototrophs and Chemotrophs.

SECTION - II

Cell Biology

Q5) **Answer the following.**

a) What is the difference between SER and RER? **[2]**

b) Distinguish between a gap junction and a tight junction. **[3]**

c) Draw a well labelled diagram of an animal cell and explain the function of any three cell organelles. **[5]**

Q6) **Answer the following.**

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

b) Describe the types of vesicles which arise from Golgi membrane. **[3]**

c) Define the term fertilization. What is the significance of fertilization? **[5]**

Q7) **Answer the following.**

a) What are chloroplasts? Add a note on its function. **[2]**

b) Describe the basic structure of chromatin. What is the role of histones in the structure? **[4]**

c) Describe Density gradient centrifugation process. **[4]**

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

a) What is the difference between nuclear envelop and cell membrane in terms of structure and function?

b) Define the terms: cell cycle and mitosis. Name the stages of cell cycle. Which is usually the longest stage?

Total No. of Questions : 8]

SEAT No. : ____

P1213

[Total No. of Pages : 2

[5431]-201
M.Sc.
BIOCHEMISTRY
BCH - 270 : Bioenergetics and Metabolism
(2013 Pattern) (Semester - II) (Credit System)

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

Instructions to the candidates:

1) ***Answers 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

(Bioenergetics and Metabolism - I)

Q1) Answer the following:

a) Describe the structure of ATP. **[2]**

b) Explain how glycolytic pathway is regulated. **[3]**

c) Describe Hill reaction and it's significance. **[5]**

Q2) Attempt the following:

a) Write a note on light and dark reaction. **[3]**

b) Describe the regulation of TCA cycle. **[3]**

c) Write a note on photosynthetic pigments. **[4]**

Q3) Answer the following:

a) Describe cyclic and non-cyclic photoinduced electron flow. **[2]**

b) Write a note on bacterial photosynthesis. **[4]**

c) Write the steps involved in glucuronic acid cycle. **[4]**

Q4) Attempt any one of the following:

a) Discuss intracellular organization of photosynthetic system. **[5]**

b) Give reactions involved in citric acid cycle. **[5]**

P.T.O.

SECTION - II
(Bioenergetics and Metabolism - II)

Q5) Answer the following:

a) How purine nucleotide biosynthesis is regulated? **[2]**

b) Write a note on gamma glutamyl cycle. **[3]**

c) Discuss reactions involved in urea cycle. **[5]**

Q6) Attempt the following:

a) What is transamination? Elucidate with suitable example. **[3]**

b) Explain biosynthesis of glutathion. **[3]**

c) Write a note on excretion of ammonia. **[4]**

Q7) Attempt the following:

a) Write the reaction involved in histidine biosynthesis. **[2]**

b) Explain the biochemical reactions involved in heme degradation. **[4]**

c) Write notes on fatty acid oxidation. **[4]**

Q8) Attempt any one of the following:

a) Explain the various reactions involved in purine degradation. **[5]**

b) Describe the steps involved in threonine biosynthesis. **[5]**

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Total No. of Questions : 8]

SEAT No. : ____

P1214

[Total No. of Pages : 2

[5431]-202

M.Sc.

BIOCHEMISTRY

BCH-271 - Techniques for Characterization of Biomolecules

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

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

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Question no. 4 and 8 are compulsory.***
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 side indicate full marks.***

SECTION - I

Biophysical Methods

Q1) Answer the following:

a) What is sedimentation coefficient. **[2]**

b) Describe the applications of partial specific volume. **[4]**

c) Discuss the theory of viscosity. **[4]**

Q2) Attempt the following:

a) Describe the measurement method of scintillation. **[3]**

b) Discuss the applications of autoradiography. **[3]**

c) Describe the use of sedimentation in determination of molecular weight. **[4]**

Q3) Answer the following:

a) What is background noise quenching? **[2]**

b) Write a note on X-ray diffraction. **[3]**

c) Describe the applications of preparatory centrifugation. **[5]**

Q4) Attempt any one of the following:

a) Describe the factors effecting on sedimentation. **[5]**

b) Write a note on gamma counter. **[5]**

P.T.O.

SECTION-II

Structure Determination of Biomolecules

Q5) Answer the following:

a) What is relation between extrinsic fluorescence and energy transfer? **[2]**

b) What are advantages of LC-MS over GC-MS? **[4]**

c) Write a note on IR. **[4]**

Q6) Attempt the following:

a) "Electronic response is proportional to biological response of analyte."Discuss this statement with suitable example. **[3]**

b) Write any one application of MALDI-TOP-MS in brief. **[3]**

c) Explain the theory of fluorescence. **[4]**

Q7) Answer the following:

a) What is the use of atmospheric pressure chemical ionization for MS analysis? **[2]**

b) Write a note on potentiometric biosensor. **[3]**

c) Explain any one application of ORD or CD. **[5]**

Q8) Attempt any one of the following:

a) Describe the theory of NMR spectrometry. What information can be obtained from NMR absorption peaks? **[5]**

b) Explain the special uses of LC-MS in biology and biochemistry. **[5]**

Total No. of Questions : 8]

SEAT No. :

P1215

[Total No. of Pages : 3

[5431]-203
M.Sc.
BIOCHEMISTRY
BCH - 272 : Biostatistics, Computer and Bioinformatics
(2013/14 Pattern) (Semester - II) (Credit System)

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
(Biostatistics and Computer)

Q1) Answer the following:

a) Calculate the value of median and also determine it graphically using ogive. **[4]**

Variable	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	3	7	10	11	15	17	2

b) Calculate geometric mean of the following data: **[4]**

Variable	5	6	7	8	9	10	11
Frequency	2	6	7	10	11	3	5

c) From the standard normal variant Z = 1.98, find the proportion (area) occupied by it as measured from zero. Represent in normal distribution curve. **[2]**

Q2) Answer the following:

a) The following data represents the number of productive tillers per plant of a wheat variety. Calculate the mean number of tillers per plant. **[2]**

Number of productive tillers = 17, 18, 16, 15, 13, 12, 11, 6, 9, 3.

P.T.O.

b) Calculate the standard deviation and standard error of data on waxy endospermic plants recorded in maize: **[4]**

waxy endospermic plants	1	2	3	4	5	6
Number of plants	12	13	5	44	3	11

c) Height and weight are recorded for 10 students. The results are given below. Calculate the regression coefficient and test the level of significance. **[4]**

Height (inches)	65	62	73	76	55	66
Weight (kgs)	60	53	50	44	60	41

Q3) Answer the following:

a) An average of 5 liter of milk is given by a cow every day. Assume this to be a poisson distribution, what is the probability that exactly 1, 2, 3 or 4 liter of milk is given by the cow per day? **[3]**

b) Find out the asthmatic mean and median from the following data: **[4]**

Number of seeds	55	2	18	16	5	11	12
Number of plants	60	53	50	44	60	30	41

c) Draw the histogram of the following data and mention its distribution shape. **[3]**

No. of pods	No. of plants
0-5	5
5-10	9
10-15	16
15-20	25
20-25	16
25-30	21

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

a) Explain the hardware system.

b) Explain input, output and format statement with example.

SECTION - II

(Bioinformatics)

Q5) Attempt the following:

a) DNA sequencining. **[4]**

b) Explain global and local alignment. **[4]**

c) Define the role of bioinformatics in biochemistry. **[2]**

Q6) Answer the following:

a) Sequence alignment and analysis. **[4]**

b) Note on GenBank. **[3]**

c) Write an account on KEGG database. **[3]**

Q7) Answer the following:

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

b) Explain PubChem Compound and Pubchem Substance. **[3]**

c) Protein structure database. **[3]**

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

a) What is PubChem Bioassay database? Explain it in detail.

b) Difference between pairwise and multiple sequence alignment? Explain.

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Total No. of Questions : 8]

SEAT No. :

P1216

[Total No. of Pages : 2

[5431]-204
M.Sc.
BIOCHEMISTRY
BCH - 273 : Membrane Biochemistry and Genetics
(2013 Pattern) (Credit System) (Semester - II)

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

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Question no. 4 and 8 are compulsory.***
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
Membrane Biochemistry

Q1) Answer the following :

a) What is cellular permeability? Explain with example. **[2]**

b) Differentiate between valinomycin and gramicidin A. **[3]**

c) Write a note on gap junction. **[5]**

Q2) Attempt the following :

a) What is diffusion? Add a note on osmoregulation. **[3]**

b) Describe the factors affecting physical properties of membranes. **[3]**

c) Write a note on exocytosis. **[4]**

Q3) Answer the following :

a) What are ligand gated ion channels? Explain with suitable example. **[2]**

b) Describe any one models of biological membrane. **[4]**

c) Write a note on bacterial cell envelope. **[4]**

Q4) Attempt any one of the following :

a) Explain the structure and mechanism of potassium channel. **[5]**

b) Describe the specialized mechanism for transport of macromolecules. Explain with example. **[5]**

P.T.O.

SECTION - II
Genetics

Q5) Answer the following :

a) What is fertility factor? Describe its role. **[2]**

b) Describe the function of complementation test? **[3]**

c) Write a note on denaturation and renaturation of DNA. **[5]**

Q6) Attempt the following :

a) What is a human teratogen? Explain its effect. **[3]**

b) Differentiate auxotroph and prototroph with example. **[3]**

c) Write a note on lactose operon. **[4]**

Q7) Answer the following :

a) What is the genotype and the phenotype? Explain with suitable example. **[2]**

b) Explain Meselson and Stahl experiment and its interpretation. **[4]**

c) Write a note on genetic code. **[4]**

Q8) Attempt any one of the following :

a) Describe the structural feature of DNA. **[5]**

b) Explain the concept of gene. How do genes work in the body? **[5]**

Total No. of Questions : 6]

SEAT No. : ____

P1217

[Total No. of Pages : 2

[5431]-301
M.Sc.
BIOCHEMISTRY
BCH - 370 : Molecular Biology
(2013 Pattern) (Semester - III) (Credit System)

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

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Solve any three questions from Q1 to Q4.***
4) ***Question 5 and 6 are compulsory.***

Q1) Explain the following: (10 marks)

a) Role of topoisomerase in replication. **[2]**

b) Role of RecA and Ruv C involved in recombination. **[3]**

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

d) Mechanism of SOS repair system. **[3]**

Q2) Answer the following: (10 marks)

a) Write note on RNA editing. **[3]**

b) Explain the steps involved in homologous recombination. **[3]**

c) Explain alternative splicing. **[4]**

Q3) Answer the following: (10 marks)

a) What is RNA editing **[3]**

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

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

Q4) Answer the following: (10 marks)

a) Define retrotransoposon with an example. **[2]**

b) How glycosylation helps in protein targeting. **[3]**

c) What is Shine Dalgaro sequence? **[2]**

d) Explain role of t-RNA in protein synthesis. **[3]**

P.T.O.

Q5) Attempt any two: (10 marks)

a) Pokaryotic transcription and translation are coupled. Explain. **[5]**

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

c) Describe two mechanisms by which genetic elements are able to move from one site to the other in the genome? **[5]**

Q6) Attempt any two: (10 marks)

a) Explain targeting of protein to lysosome and chloroplast. **[5]**

b) What are retrovirus? Explain HIV in detail. **[5]**

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

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Total No. of Questions :8]

SEAT No. :

P1218

[Total No. of Pages : 2

[5431]-302
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 labelled diagram must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Question 4 and 8 are compulsory.***
4) ***Solve any two questions from Q. No. 1 to 3 and any two questions from Q. No. 5 to 7.***

SECTION-I

(Medical Biochemistry)

Q1) Answer the following:

a) Give the normal composition of CSF. **[2]**

b) Elaborate on types of Influenza. **[4]**

c) Give the pathophysiology of nickle cell anemia. **[4]**

Q2) Answer the following:

a) Define the term analgesics **[2]**

b) What is role of viruses in carcinogenesis. **[4]**

c) Give features of hallucinogenesis **[4]**

Q3) Attempt the following:

a) Define drugs and antibiotics. **[2]**

b) Give function, structure of lysosome in animal cell **[4]**

b) Explain biochemistry of (CHD) Coronary Heart Diseases **[4]**

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

a) Explain the mechanism of apoplosis.

b) Explain α thalassemia Pathophysiology

P.T.O.

SECTION-II

(Immunology)

Q5) Answer the following:

a) Define isotypes and allotypes. **[2]**

b) Explain classic complement system. **[4]**

c) Explain in detail principle and procedure of western blotting. **[4]**

Q6) Answer the following:

a) What are natural killer cells. **[2]**

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

c) Discuss the features of immunodeficiency disease with example. **[4]**

Q7) Answer the following:

a) Explain vaccine with an example. **[2]**

b) Explain innate and humoral immune response **[4]**

c) Give the characteristics features of anaphylaxis **[4]**

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

a) Differentiate between competetive ELISA and sandwich ELISA.

b) Elaborate on primary and secondary lymphoid organ and their significance with neat diagram.

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Total No. of Questions : 8]

SEAT No. :

P1219

[Total No. of Pages : 2

[5431]-303

M.Sc.

BIOCHEMISTRY

BCH - 372 : Neurochemistry and Biochemistry of Specialized Tissues

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

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

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Question no. 4 and 8 are compulsory.***
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) Explain the function of hypothalamus. **[2]**

b) How does the brain control the ANS? **[4]**

c) What are the components of limbic system? Explain the functions of limbic system. **[4]**

Q2) Attempt the following:

a) Describe sensory areas and association areas of the brain. **[3]**

b) Write a note on Circadian rhythms **[3]**

c) Explain the steps involved in the synthesis and storage of any two neurotransmitters. **[4]**

Q3) Answer the following:

a) What is arch reflex? **[2]**

b) What are neuroglia and its types? Enumerates functions of each glial cell. **[3]**

c) Describe the role of proteins in memory and learning process. **[5]**

Q4) Attempt any one of the following:

a) What are sensory modalities and sensory circuits? **[5]**

b) How is pain sensation transmitted to the cortex? How is pain perceived in CNS? **[5]**

P.T.O.

SECTION - II

(Biochemistry of Specialized Tissues)

Q5) Answer the following:

a) What is CPS of chemotaxis? **[2]**

b) Explain the kinetics of desensitization and recovery of acetylcholine receptor. **[4]**

c) What are stereocilia? How does the motion of the hair bundle create a change in membrane potential? **[4]**

Q6) Attempt the following:

a) Describe the signaling pathway involving in termination of the flagellar motor? **[3]**

b) What are nerve toxins? Explain the mode of action of any two toxins on nerve conduction. **[3]**

c) Describe structural differences between actin and myosin and how those differences support their function of interacting together to produce muscle contraction. **[4]**

Q7) Answer the following:

a) What is the relation between odorant receptor gene expression and individual neuron? **[2]**

b) Write a note on transducin. **[3]**

c) Describe the organization and function of the taste buds. **[5]**

Q8) Attempt any one of the following:

a) Define contraction cycle and explain the four steps involved in contraction cycle. **[5]**

b) What is meant by chemical synapse transmission and electrical synapse transmission? **[5]**

Total No. of Questions : 8]

SEAT No. :

P1220

[Total No. of Pages : 2

[5431]-304

M. Sc.

BIOCHEMISTRY

BCH - 373 : Toxicology and Plant Biochemistry

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

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

Instructions to the candidates:

1) ***Attempt any two questions from Q1 to Q3 and 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) Define toxicology. **[2]**

b) Explain in detail descriptive animal toxicological test. **[4]**

c) Explain acute verses chronic toxicology. **[4]**

Q2) Answer the following :

a) Define LADME. **[2]**

b) Explain with suitable example the processes of bioactivation. **[4]**

c) Give the industrial application of toxicology. **[4]**

Q3) Attempt the following :

a) Define the systemic toxicology. **[2]**

b) What is the toxic effect of DDT? Explain the pathogenesis of this effect. **[4]**

c) Explain the difference between phase I and phase II biotransformation reaction. **[4]**

P.T.O.

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

a) Explain with example the toxicity of insecticides.

b) Explain AIMS test in detail.

SECTION - II
(Plant Biochemistry)

Q5) Answer the following :

a) What is the role of cytokinin in plant growth? **[2]**

b) Explain the biochemical changes occurring during seed germination. **[4]**

c) Explain the specific disorders of TM. **[4]**

Q6) Answer the following :

a) Enlist any four alkaloids with their medicinal activity. **[2]**

b) Give the role of hormones in senescence and abscission. **[4]**

c) Describe the role of nitrogenase system and nitrate reductase in plant. **[4]**

Q7) Answer the following :

a) Give the deficiency disorders related to magnesium and zinc deficiency. **[2]**

b) Explain the structure of chloroplast. **[4]**

c) Give the energy production in plant cells and metabolism of sucrose and starch. **[4]**

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

a) Explain the Z-scheme of photosynthesis.

b) What is plant defence? Give the role of plant defence components in this process.

Total No. of Questions : 8]

SEAT No. :

P1221

[Total No. of Pages : 2

[5431]-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) ***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.***
3) ***Figures to the right indicate full marks.***

SECTION - I
Physiological Biochemistry

Q1) Answer the following :

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

b) Write a note on mineral metabolism. **[3]**

c) Describe the composition of wine. Explain how analysis of Urine helps in the diagnosis of certain disorder of the body. **[5]**

Q2) Attempt the following :

a) Write the anatomy of liver. **[3]**

b) What is Bohr effect? **[3]**

c) Explain the physiological function of kidney. **[4]**

Q3) Answer the following :

a) What is intrinsic pathway of blood clotting? **[2]**

b) Discuss the mechanism involved in water balance. **[4]**

c) What are the different types of buffer and explain its function? **[4]**

Q4) Attempt any one of the following :

a) Discuss the role of various cells present in blood. **[5]**

b) Describe the transport of O_2 and CO_2 via blood. **[5]**

P.T.O.

SECTION - II
Endocrinology

Q5) Answer the following :

a) Write the significance of organification in thyroid hormone synthesis. **[2]**

b) Explain the effect of cholera toxin. **[4]**

c) Write any two disorders related to hormones. **[4]**

Q6) Attempt the following :

a) Explain the role of glucogen in carbohydrate metabolism. **[3]**

b) What are catecholamines? Describe the physiological functions of catecholamines. **[3]**

c) Describe the target - cell - concept. **[4]**

Q7) Answer the following :

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

b) Write a note on zinc fingers. **[3]**

c) What is PTH? Describe the steps involved in the synthesis of PTH. **[5]**

Q8) Attempt any one of the following :

a) What are the major biochemical effects of insulin? **[5]**

b) Write a note on adrenal steroids. **[5]**

Total No. of Questions : 8]

SEAT No. :

P1222

[Total No. of Pages : 2

[5431]-402

M.Sc.

BIOCHEMISTRY

BCH - 471 : Fermentation Technology and Tissue Culture

(2013/14 Pattern) (Semester-IV) (Credit Pattern)

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

(Fermentation Technology)

Q1) Answer the following.

a) Explain the role of agitation and aeration in fermentation. **[3]**

b) Write note on range of fermentation process. **[4]**

c) What is continuous culture? **[3]**

Q2) Answer the following.

a) How will you proceed for isolation of auxotropic mutants? **[4]**

b) Write note on media optimization. **[4]**

c) Define continuous culture with an example **[2]**

Q3) Answer the following:

a) How will you choose a recovery process during fermentation? **[3]**

b) What are different methods of preservation of industrially important microorganisms? **[4]**

c) What are different nitrogen sources used in fermentation. **[3]**

Q4) Write short note on any one.

a) Role of chromatography in product recovery. **[5]**

b) Explain design of fermentor. **[5]**

P.T.O.

SECTION-II

(Tissue culture)

Q5) Answer the following.

a) Give the advantages of natural media. **[2]**

b) What are cell repositories? Give its maintenance and importance. **[4]**

c) Describe protoplast fusion. **[4]**

Q6) Answer the following.

a) Discuss the factors affecting success of cell culture. **[3]**

b) Give the advantages and disadvantages of natural and synthetic media. **[3]**

c) Explain the technique of protoplast fusion. **[4]**

Q7) Answer the following. **[2]**

a) What is cell banking? **[4]**

b) What are heterocaryon and variant cell give example. **[4]**

c) Describe phytochemistry of the metabolites of medicinal plants.

Q8) Write short notes on ANY ONE.

a) What are characteristic of transformed cells? **[5]**

b) Describe in details different cell culture methods. **[5]**

Total No. of Questions : 8]

SEAT No. :

P1223

[Total No. of Pages : 2

[5431]-403
M.Sc.
BIOCHEMISTRY
BCH - 472 : Genetic Engineering
(2013/14 Pattern) (Credit System) (Semester - IV)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Solve any two questions from Q1 to Q3 and Q5 to Q7.***
5) ***Question 4 and 8 are compulsory.***

SECTION - I

Q1) Answer the following :

a) Define Genetic engineering and Vector. **[2]**

b) Write note on role of polymerase enzymes in genetic engineering. **[4]**

c) How are viruses used as vectors in plants? Explain one example in detail. **[4]**

Q2) Answer the following :

a) What is meant by transfection? **[2]**

b) Write note on process of southern blotting. **[4]**

c) What are reporter genes? Discuss their different types. **[4]**

Q3) Answer the following :

a) Distinguish between plaques and colonies? **[2]**

b) Explain the organization of T-DNA and its importance in genetic engineering. **[4]**

c) Explain shotgun method of sequencing in short. **[4]**

Q4) Explain in detail :

a) Write note on foot printing using DNasel. **[5]**

OR

b) Distinguish between Genomic and cDNA library. **[5]**

P.T.O.

SECTION - II

Q5) Answer the following :

a) What is genome annotation? **[2]**

b) Write note on recombinant vaccines. **[4]**

c) Explain principle and advantages of PCR. **[4]**

Q6) Answer the following :

a) Explain proteome? **[2]**

b) Explain applications of antisense RNA technology. **[4]**

c) Explain herbicide resistance with an example. **[4]**

Q7) Answer the following :

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

b) Describe agrobacterium mediated gene transfer. **[4]**

c) Explain genome annotation. **[4]**

Q8) Explain in detail :

a) Explain principle, working and applications of RFLP. **[5]**

OR

b) Discuss the methods used to transfer genes in plant cells. **[5]**

Total No. of Questions : 8]

SEAT No. :

P1224

[Total No. of Pages : 2

[5431]-404
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) Explain the effect of refining on nutritional quality of food. **[2]**

b) Describe the relationship between dietary lipid and cholestrol metabolism. **[4]**

c) Enlist the organs affected by alcohol consumption. Give its effect. **[4]**

Q2) Answer the following:

a) What is acidic and basic food gives example. **[3]**

b) Write a short note on irradiation of food. **[3]**

c) What are the factors which effects the digestion and absorption of food? **[4]**

Q3) Answer the following:

a) Explain the effect of exercise on metabolic adaptation. **[3]**

b) Explain the effect of cooling on nutritional quality of food. **[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) Describe the nutritional status of dairy product and cereals in India.

b) What is food toxin? Give the adverse effect of alcohol.

SECTION - II

(Food Technology)

Q1) Answer the following:

a) What is food spoilage? **[2]**

b) What are the different steps involved in starch production? **[3]**

c) What is genetically modified food? Discuss its merits and demerit? **[5]**

Q2) Answer the following:

a) Enlist the food obtained from plant origin. **[2]**

b) Write note on natural and synthetic syrups. **[4]**

c) Elaborate on various types of food additives. **[4]**

Q3) Answer the following:

a) What are flavouring agents? **[2]**

b) Explain the process of monitoring the quality of food. **[3]**

c) Give the various methods of food preservation. **[5]**

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

a) Explain different food additives used as a sweetners and colour in food industry.

b) Give an account on various enzymes and their use in food processing industry.

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