Total No. of Questions : 8]

SEAT No. :

P2889

[Total No. of Pages : 3

[4724]-1001
M.Sc.
BIOCHEMISTRY
BCH- 170: Biomolecules
(2013 Pattern) (Credit System) (Semester - I)

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

Instructions to the candidates:

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

SECTION - I

Q1) Answer the following:

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

b) Give any two general reactions of sugars, with a suitable example of each. **[3]**

c) Discuss the biological significance of structural carbohydrates. **[4]**

Q2) Answer the following:

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

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

c) Discuss the structure, biochemical functions and deficiency of vit Riboflavin. **[5]**

P.T.O.

Q3) Answer the following:

a) Draw the structure of triacyl-glycerol. **[2]**

b) Write a note on lipid bilayer. What is its biological significance? **[4]**

c) Enumerate the properties of water. Add a note on interaction of water with biomolecules. **[4]**

Q4) Answer any one:

a) Give the classification of lipids with suitable examples. **[5]**

b) Give the significance of carbohydrates in our body. **[5]**

SECTION - II

Q5) Answer the following:

a) write a note on the peptide bond? **[3]**

b) Write a note on rare amino acids. What is their biological significance. **[3]**

c) Differentiate between proteolysis and denaturation of proteins. give suitable examples. **[4]**

Q6) Answer the following:

a) What is Sanger's reagent? Explain its use. **[2]**

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

c) Describe the Edmans reaction for protein sequence analysis. **[4]**

Q7) Answer the following:

a) An amino acid is a 3 witter ion. Explain. **[2]**

b) Write a note on primary structure of protein. **[3]**

c) Explain the principle and procedure of solid phase synthesis of oligo peptides. **[5]**

Q8) Answer any one the following:

a) Classify amino acids on the basis of their 'R' groups. **[5]**

b) Give the biological function of proteins. **[5]**

EEE

Total No. of Questions : 8]

SEAT No. :

P2890

[Total No. of Pages :2

[4724] - 1002
M.Sc.
BIOCHEMISTRY
BCH - 171 : Enzymology and Biophysical Techniques
(2013 Pattern) (Credit System) (Semester - I)

Time : 3Hours] *[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 activation energy? **[2]**

b) Why is it important to measure pre-steady state kinetics when studying the catalytic mechanism of an enzyme? **[4]**

c) Write a note on affinity labeling. **[4]**

Q2) Attempt the following:

a) Why does the activity of enzymes vary with temperature? **[3]**

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

c) Write a short note on zymogen activation. **[4]**

Q3) Answer the following:

a) What is the significance of enzyme turnover? **[2]**

b) Comment on catalytic power and regulation of enzyme activity. **[3]**

c) What do you understand by enzyme inhibition? Discuss irreversible inhibitors and reversible inhibitors involved in enzyme inhibition. **[5]**

P.T.O.

Q4) Attempt any one of the following:

a) Write short notes on the followings: **[5]**

i) Allosteric Enzymes.

ii) Product inhibition.

b) How substrate cycle and interconvertible enzyme cycle amplify the initial signal? Explain with suitable example. **[5]**

SECTION - II

(Biophysical Techniques)

Q5) Answer the following:

a) What is a restriction map? **[2]**

b) Describe the principle and method of ion exchange chromatography. **[4]**

c) What is the principle of 2D PAGE-gel electrophoresis? Explain its application in proteomics study? **[4]**

Q6) Answer the following:

a) Mention three unique advantages of size exclusion chromatography. **[3]**

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

c) Why is it important to prepare a standard curve for each spectrophotometer? **[4]**

Q7) Answer the following:

a) What is the difference between an isocratic pump and a gradient pump? **[2]**

b) How are proteins eluted from affinity chromatography column? **[3]**

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

Q8) Attempt any one of the following:

a) Write a note on DNA cellulose chromatography. **[5]**

b) Describe the steps for the purification of enzymes. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2891

[Total No. of Pages : 2

[4724] - 1003
M.Sc.
BIOCHEMISTRY
BCH - 172 : Microbiology and Cell Biology
(2013 Pattern) (Credit System) (Semester - I)

Time : 3Hours] *[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 two from Q-5 to Q-7.***
4) ***Figures to the right indicate full marks.***

SECTION - I

(Microbiology)

Q1) Answer the following:

a) Explain the principle of gram staining. **[3]**

b) What do you understand by growth curve. **[5]**

c) Why oxygen in toxio to anaerobic bacteria. **[2]**

Q2) Answer the following:

a) What is mode of action of cholera toxin. **[3]**

b) Explain nitrogen cycle. **[4]**

c) What are steps involved in the process of viral infection. **[3]**

Q3) Answer the following:

a) Write in short preservation of pure culture. **[3]**

b) Write in detail bacterial cell wall. **[3]**

c) Give the application of fluorescent Microscope. **[4]**

P.T.O.

Q4) Answer any one of the following:

a) Explain electron Microscope with reference to SEM and TEM. **[5]**

b) What are the different methods for isolation of pure culture. Explain the one which is the best for isolation. **[5]**

SECTION - II

(Cell Biology)

Q5) Answer the following:

a) Give the salient features of a plant cell. **[3]**

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

c) What is density gradient centrifugation? How are lysomes identified using marker enzymes? **[4]**

Q6) Answer the following:

a) Give two functions of the endoplasmic reticulum. **[2]**

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

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

Q7) Answer the following:

a) Enlist the stages of the cell cycle. **[2]**

b) Give the structure and function of mitochondria. **[4]**

c) Write a note on the composition and structure of plant cell wall. **[4]**

Q8) Answer any one of the following:

a) Describe in detail the process of mitosis. **[5]**

b) Write an account of the composition and structure of the plasma membrane. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2892

[Total No. of Pages : 2

[4724]-2001
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) ***Answer to both the section should be solved in different answer sheets.***
2) ***Solve any two question 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

Q1) Attempt the following:

a) Give the significance of glyoxalate pathway. **[4]**

b) What is the role of glycogenin in glycogen synthesis? **[3]**

c) List out the enzymer of fatty acid synthase complex. **[3]**

Q2) Answer the following:

a) What is free energy, enthalpy and entropy? **[2]**

b) Write a note on lactose intolerance and Galactosemia. **[4]**

c) Elucidate the regulation of glycolysis and gluconeogenesis. **[4]**

Q3) Attempt the following:

a) What are the types of oxidation of fatty acids. **[2]**

b) Give the significance of pyruvate dehydrogenase complex. **[3]**

c) Explain the steps involved in pentose phosphate pathway. **[5]**

P.T.O.

Q4) Answer Any One of the following:

a) Explain the steps involved in the synthesis of ascorbic acid. **[5]**

b) Write a note on inhibitors and uncouplers of ETC. **[5]**

SECTION-II

Q5) Answer the following:

a) Write a note on Inborn errors of amino acid metabolism. **[3]**

b) Show the steps involved in formation of uric acid formed in humans. **[3]**

c) Enlist the aminoacids that can be synthesized from pyruvate. **[4]**

Q6) Attempt the following:

a) What is the significance of xanthine oxidase? **[2]**

b) Give the significance of pyridoxal phosphate in aminoacid metabolism. **[3]**

c) Explain purine biosynthesis by denovo pathway. **[5]**

Q7) Answer the following:

a) Give two examples of salvage pathway of nucleotide synthesis. **[2]**

b) Show the regulation of nucleotide synthesis. **[4]**

c) Discuss the clinical manifestations of phenylketonuria and alkaptonuria. **[4]**

Q8) Answer Any One of the following:

a) Elaborate on porphysin biosynthesis. **[5]**

b) How are branched amino acids degraded in our body? **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2893

[Total No. of Pages : 2

[4724]-2002
M.Sc.
BIOCHEMISTRY
BCH-271 : Techniques in Characterization of Biomolecules
(Semester-II) (Credit System) (2013 pattern)

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

Instructions to the candidates:

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

SECTION-I

Biophysical Methods

Q1) Answer the following:

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

b) What are the different methods used for measurement of concentration distribution in an analytical centrifuge cell. **[4]**

c) What is the theory of X-ray. **[4]**

Q2) Attempt the following:

a) Explain the effect of shape on standard sedimentation coefficient. **[3]**

b) Explain stripping film method of autoradiography. **[3]**

c) Distinguish between boundary and band sedimentation. **[4]**

Q3) Answer the following:

a) Define and give the significance of sedimentation coefficient. **[2]**

b) What are the methods used for measurements of viscosity of the solution. **[3]**

c) Give application of partial specific volume. How it is measured by pycnometry? **[5]**

P.T.O.

Q4) Attempt Any One of the following:

a) Draw a neat diagram of atomic absorption spectrometer. Describe the theory of in brief. **[5]**

b) Give the principle and functions of liquid scintillation counter. **[5]**

SECTION-II

(Structure determination of Biomolecules)

Q5) Answer the following:

a) What differences might be expected between NMR spectra of water and ice? Explain. **[2]**

b) What is fluorescence depolarization? Describe the experimental arrangement for measuring the polarization of fluorescence. **[4]**

c) What are the advantages of LC-MS over GC-MS. **[4]**

Q6) Attempt the following:

a) Describe the advantages of atmospheric pressure photoionization. **[3]**

b) What are the steps required for sample preparation for MALDI-MS analysis. **[3]**

c) "Electronic response is proportional to biological response of analyte". Discuss this statement with reference to MM graph. **[4]**

Q7) Answer the following:

a) Enlist the applications of infrared spectroscopy. **[2]**

b) Explain the theory of fluorescence. **[3]**

c) What are the properties of ESR spectra? **[5]**

Q8) Attempt Any One of the following:

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

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

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Total No. of Questions : 8]

SEAT No. :

P2894

[Total No. of Pages :2

[4724]-2003
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 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 or Q-3 and any two from Q-5 or Q-7.***
4) ***Figures to the right indicate full marks.***

SECTION -I

(Membrane Biochemistry)

Q1) Answer the following;

a) How protein-lipid interaction takes place. **[3]**

b) Explain sodium potassium channels. **[3]**

c) What are the different types of transport mechanism. Explain the role of protein in transport. **[4]**

Q2) Answer the following:

a) Write a note on gramicidin. **[2]**

b) Give some example of modes of penetration of antimicrobial agents. **[3]**

c) Elaborate on various modes used to explain membrane structure. **[5]**

Q3) Answer the following:

a) What is membrane asymmetry? Give example. **[2]**

b) Elucidate the various models proposed to affirm the membrane structure. **[4]**

c) Explain how temperature affects fluidity of membrane. **[4]**

P.T.O.

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

a) What are miscells and liposomes?

b) How do membrane lipids influence the curvature of the membrane.

SECTION -II

(Genetics)

Q5) Answer the following:

a) Write a note on codominance and incomplete dominance with suitable examples. **[3]**

b) Define plasmid and enlist different types of plasmids. **[3]**

c) Diagrammatically show the steps of life cycle of Bacteriophage. **[4]**

Q6) Answer the following:

a) Write a note on tetrad analysis with example. **[3]**

b) Describe structure of Watson and crick model of DNA. **[3]**

c) Give Mendel's principle of law of independent assortment. **[4]**

Q7) Answer the following:

a) Write a note on lytic cycle of bacteriophage. **[3]**

b) Genetic code is degenerate. Explain. **[3]**

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

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

a) Write a note on lac operon.

b) Explain different types of RNA.

EEE

Total No. of Questions : 8]

SEAT No. :

P2895

[Total No. of Pages :4

[4724] - 2004
M.Sc.
BIOCHEMISTRY
BCH - 272 : Biostatistics Computer and bioinformatics
(2013 Pattern) (Semester - II) (Creidt)

Time : 3Hours] *[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.***
5) ***Supplementary will be provided for checking P-values.***
6) ***Graph papers will be provided.***

SECTION - I

Q1) Answer the following:

a) Calculate the value of median and also determine it graphically using ogive. **[3]**

Variable	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	4	6	10	15	11	7	3

b) Calculate the geometric mean of the following data: **[3]**

Variable	6	7	8	9	10	11
Frequency	4	7	10	9	6	2

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

Waxy endospermic Plants	7	8	9	10	11	12
No. of Plants	13	13	18	17	15	14

P.T.O.

Q2) 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) An average of 5 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 and 4 litres of milk is given per day by the buffalo? **[3]**

c) Height (inches) and weight (kgs.) are recorded for 10 students. The results are given below. Calculate the regression coefficient and test the level of significance. **[5]**

Height (inches)	62	72	78	58	65	70	66	63	60	72
Weight (Kgs)	50	65	63	50	54	60	61	55	54	65

Q3) 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 = 10, 11, 12, 9, 8, 19, 15, 14, 12

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

Number of angular seeded plants	12	8	17	10	11	16	18	14	6	7
Number of plants	39	33	42	40	47	42	60	50	22	25

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

Samples	1	2	3	4	5	6	7	8	9	10
Lake 1	0.62	0.87	0.54	1.36	0.87	0.62	1.24	1.36	1.10	1.24
Lake 2	0.79	1.68	1.59	0.99	1.61	1.49	1.39	1.24	1.24	1.86

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

a) Data on hair colour and the eye colour are given in the table. Calcualte the chi-square value. Determine the association between the hair colour and the eye colour.

		Fair	Brown	Black	Total
Eye colour	Blue	15	20	5	40
	Grey	20	20	10	50
	Brown	25	20	15	60
	Total	60	60	30	150

b) Draw a percentage bar diagram and a pie diagram of the following data relating to the areas under cultivation of different crops in Maharashtra in the year 1987-88.

Crops	Rice	Jowar	Bajra	Maize	Wheat
Area in thousand hectares	3123	2572	324	296	11

SECTION - II

Q5) Answer the following:

a) State the salient features of any protein 3D structure visualization software. **[3]**

b) With respect to the GenBank, explain the need of curations and annotation of databases. **[3]**

c) What is Entrez? Describe why Entrez is most powerful tool to retrieve the biological data. **[4]**

Q6) Answer the following:

a) Differentiate between Orthologous and Paralogous genes. **[2]**

b) Explain how multiple sequence alignment can be used to find the conserved regions of protein sequences. **[3]**

c) Explain how sequence data is generated for *Expressed Sequence Tags database division of NCBI.* **[5]**

Q7) Answer the following:

a) Differentiate between sequence similarity and sequence homology. **[2]**

b) Differentiate between Global and Local sequence alignment. **[4]**

c) What is progressive alignment? Explain how Clustal W uses progressive alignment for multiple sequence alignment. **[4]**

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

a) What is Local sequence alignment? Using Smith-Waterman Algorithm determine the optimal alignment of following DNA sequences

Seq 1 : CATGCGGTAC

Seq 2 : CTAGCGCTAC

Use following parameters for obtaining the alignment. Identity: +2, Mismatch: 0, Gap: 0.

b) Explain why there is need of Heuristics approach in database sequence search. Explain any one heuristics approach in sequence similarity search.

Total No. of Questions : 6]

SEAT No. :

P2896

[Total No. of Pages : 2

[4724]-3001
M.Sc.
BIOCHEMISTRY
BCH- 370: Molecular Biology
(2013 Pattern) (Credit System) (Semester - III)

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

Instructions to the candidates:

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

Q1) Answer the following: (10 Marks)

a) Give any two different types of DNA damage. **[2]**

b) Why alternative splicing is required? **[3]**

c) Explain role of RNA polymerase. **[2]**

d) Explain in short features of retroviruse. **[3]**

Q2) Answer the following: (10 Marks)

a) Why are t-RNAs called as adaptor molecules? **[3]**

b) Explain base excision repair system. **[3]**

c) Explain inhibitors of protein synthesis. **[4]**

Q3) Answer the following: (10 Marks)

a) What are SINES &LINES? **[3]**

b) Enlist the types of RNA polymerase in eukaryotes. **[3]**

c) Give roles of RecA, RuvA,RuvB, RuvC involved in recombination. **[4]**

P.T.O.

Q4) Answer the following: (10 Marks)

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

b) What role glycosylation plays in protein targeting? **[3]**

c) Give the role of topoisomerase in DNA replication. **[2]**

d) What is RNA editing? **[3]**

Q5) Attempt any two: (10 Marks)

a) Write in brief about regulation of transcription. **[5]**

b) Explain why Ames test can be used for detecting carcinogenesis. **[5]**

c) Explain DNA replication is semiconservative. **[5]**

Q6) Attempt any two: (10 Marks)

a) Explain the steps involved in prokaryotic translation. **[5]**

b) Explain chromatin remodeling. **[5]**

c) Explain the lysosomal transportation of protein. **[5]**

EEE

Total No. of Questions : 8]

SEAT No. :

P2897

[Total No. of Pages :2

[4724] - 3002

M.Sc. (Biochemistry)

BCH - 371 : MEDICAL BIOCHEMISTRY AND IMMUNOLOGY

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

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

Instructions to the candidates:

1) ***Neat labelled diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Questions 4 & 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 following:

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

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

c) Give the pathaphysiology of sickle cell anemia. **[4]**

Q2) Answer following:

a) Give any two basic approaches by WHO for control of cancer. **[2]**

b) Give features of hallucinogenes. **[4]**

c) Explain biochemistry of (CHD) coronary heart diseases. **[4]**

Q3) Answer following:

a) Name any two causes of hemoglobinopathies. **[2]**

b) Explain α-thalassemias pathaphysiology. **[4]**

c) Give function structure of lysosome in animal cell. **[4]**

P.T.O.

Q4) Answer in detail:

a) Explain Molecular genetics of cancer. **[5]**

OR

b) Any one mechanism of resistance to antibiotics. **[5]**

SECTION - II

(Immunology)

Q5) Answer the following:

a) Explain graft rejection. **[2]**

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

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

Q6) Answer the following:

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

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

c) Explain humoral immuneresponses. **[4]**

Q7) Answer the following:

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

b) Explain innate immunity. **[4]**

c) What is junctional flexibility? **[4]**

Q8) Explain in detail:

a) Structure of antibody in detail with labeled diagram. **[5]**

OR

b) Explain in detail western blotting? **[5]**

Total No. of Questions : 8]

SEAT No. :

P2898

[Total No. of Pages :3

[4724] - 3003

M.Sc. (BioChemistry)

BCH-372: NEUROCHEMISTRY AND BIOCHEMISTRY OF SPECIALIZED TISSUES

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

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

Instructions to the candidates:

1) ***Answers to both the sections should be written in 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 the difference between brain and cerebrum? **[2]**

b) Describe the types of neuronal circuits. **[4]**

c) Explain the role of NMDA and AMPA glutamate receptors in learning and memory process. **[4]**

Q2) Attempt the following.

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

b) What are the components and functions of the SNS, ANS, and ENS? **[3]**

c) Describe the synthesis, storage, mode of action and uptake of acetylcholine. **[4]**

Q3) Answer the following.

a) What is the function of the myelin sheath? Do all axons present a myelin sheath? **[2]**

P.T.O.

b) Explain the role of reticular formation. **[3]**

c) Describe the components and functions of the diencephalon. **[5]**

Q4) Attempt any one the following.

a) According to the stimuli they collect how are the sensory receptors classsified? Explain the functions of each sensory receptor. **[5]**

b) What is circadian rhythm? Explain the role on biomolecules involved in circadian rhythm. **[5]**

SECTION - II

(Biochemistry of Specialized Tissues)

Q5) Answer the following.

a) What is the relationship between ATP and creatine phosphate in the production of energy used for skeletal muscle contractions? **[2]**

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

c) How does synaptic transmission between neurons take place? **[4]**

Q6) Attempt the following.

a) Discuss the role of Ca^{2+} in the regulation of muscle contraction. **[3]**

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

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

Q7) Answer the following.

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

b) Discuss the role of cGMP, phosphodiesterase and transducine in visual excitation. **[3]**

c) What are the differences between taste and olfaction receptors? **[5]**

Q8) Attempt any one of the following.

a) How many different kinds of photosensitive pigments are found in the human retina? How they produce electrical responses in the retina and their relation to colour vision? **[5]**

b) Describe and give the functions of the three kinds of proteins found in muscle tissue. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2899

[Total No. of Pages :2

[4724] - 3004
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) ***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 side indicate full marks.***

SECTION - I

(Toxicology)

Q1) Answer the following.

a) Explain the Dose-Response relationship. **[2]**

b) What is the fate of heavy metal lead in human body? **[4]**

c) What are the different areas of toxicology? Explain their roles. **[4]**

Q2) Attempt the following.

a) Give the composition of snake venom. **[3]**

b) Distinguish between venomous and poisonous animals. **[3]**

c) What is response curve? Give the significance of LD_{50} and MLD. **[4]**

Q3) Answer the following.

a) What do you understand the terms acute toxicity and chronic toxicity? **[2]**

b) Give the forensic applications of toxicology. **[3]**

c) Comment on membrane as a major barrier for the entry of toxicants. **[5]**

P.T.O.

Q4) Attempt any one of the following.

a) What is bioactivation? Explain with suitable example. **[5]**

b) Discuss in brief the phase-I metabolism of xenobiotic detoxification. **[5]**

SECTION - II

(Plant Biochemistry)

Q5) a) List out the micro and macro element required for plant growth. **[2]**

b) Comment on cyclic and non cyclic electron flow in photo synthetic system. **[3]**

c) Discuss the role of nitrogenase system and nitrate reductase in plant. **[5]**

Q6) a) What are plant hormones? Give their role in plant development. **[5]**

b) Explain the role of secondary metabolites with reference to flavonoids, Gum pectin, terpenoids and lignins. **[5]**

Q7) a) Give the biochemical changes occurring during seed germination. **[4]**

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

c) Explain the deficiency disorders caused due to iron and manganese. **[3]**

Q8) Answer any one.

a) Explain seed germination and storage protein. **[5]**

b) What is plant breeding? Give application of plant breeding in crop improvement with suitable example. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2900

[Total No. of Pages : 2

[4724]-4001
M.Sc.
BIOCHEMISTRY
BCH-470 : Physiological Biochemistry and Endocrinology
(2013 Pattern) (Semester-IV) (Credit System)

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

Instructions to the candidates:

1) ***Answer to both the section should be solved in different answer sheets.***
2) ***Solve any two question 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) Write the anatomy of liver. **[3]**

b) Explain the physiological function of kidney. **[3]**

c) Give the absorption of carbohydrate protein, lipids minerals and vitamin. **[4]**

Q2) Attempt the following:

a) Give the list of clotting factors. **[2]**

b) Write in detail the abnormalities associated with acid-have balance. **[4]**

c) Write a note on water and mineral metabolism. **[4]**

Q3) Answer the following:

a) Write the principles of gaseous exchange during respiration. **[3]**

b) What are different kidney disorders? **[3]**

c) Write a note on Jaundice and its types. **[4]**

P.T.O.

Q4) Answer Any One of the following:

a) Explain intrinsic and extrinsic pathway. **[5]**

b) What are the different types of buffer and explain its function? **[5]**

SECTION-II

(Endocrinology)

Q5) Answer the following:

a) What is PTH? Explain its role in brief. **[2]**

b) Describe the general regulation of secretion of growth hormone. **[3]**

c) What are the intracellular changes that occur after androgen binds its receptor. **[5]**

Q6) Attempt the following:

a) What is glucagon? What are its target cells? **[3]**

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

c) How does the endocrine system work with other body system, such as the nervous system & the circulatory system. **[4]**

Q7) Answer the following:

a) What are thyroxine? Describe the function of thyroxine in brief. **[2]**

b) What is the significance of altering kinase activity in target cells. **[4]**

c) Describe the function of each of the following harmones TSH, GnRH, LH and PRL. **[4]**

Q8) Attempt Any One of the following:

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

b) Describe the mechanism to control secretion of insulin. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2901

[Total No. of Pages : 2

[4724]-4002
M.Sc.
BIOCHEMISTRY
BCH-471 : Fermentation Technology and Tissue Culture
(2013 Pattern) (Semester-IV) (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 different criteria for isolation of industrially important micro-organism? **[3]**

b) Discuss various factors that affect downstream processing of biotech products. **[4]**

c) How will you proceed for isolation of resistant mutant? **[3]**

Q2) Attempt the following:

a) Explain the role of agitation and aeration in fermentation. **[4]**

b) Discuss the various methods for effluent treatment. **[4]**

c) Explain any one method used for product recovery. **[2]**

Q3) Answer the following:

a) Discuss in brief the range of fermentation process. **[3]**

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

c) Fermentation technology is widely applied in many fields. Justify this statement. **[3]**

P.T.O.

Q4) Attempt Any One of the following:

a) Explain the effect of inducer and precursor in fermentation. **[5]**

b) Explain the strain improvement using auxotrophic mutants. **[5]**

SECTION-II

(Tissue Culture)

Q5) Answer the following:

a) Write a note on somaclonal variation. **[3]**

b) Explain primary and secondary cell culture. **[3]**

c) Describe in detail Hanging drop, suspension and monolayer culture. **[4]**

Q6) Attempt the following:

a) Give the importance of serum in media preparation. **[3]**

b) Explain the technique of Agrobacterium mediated hair root culture. **[3]**

c) Describe in detail different cell culture methods. **[4]**

Q7) Answer the following:

a) Explain the technique of protoplast fusion. **[3]**

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

c) Explain the characteristics of transformed cell. **[4]**

Q8) Answer Any One of the following:

a) Discuss the techniques of micropropagation in detail. **[5]**

b) What do you mean by Haploid culture and embryo culture? **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2902

[Total No. of Pages :2

[4724]-4003
M.Sc.
BIOCHEMISTRY
BCH- 472: Genetic Engineering
(2013 Pattern) (Credit System) (Semester - IV)

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

Instructions to the candidates:

1) ***Answers to both sections should be written on separate answer sheets.***
2) ***Question No. 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 the right side indicate full marks.***

SECTION -I

Q1) Answer the following:

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

b) Draw and explain T-DNA in Ti - plasmid. **[4]**

c) Discuss features of a good vector? Explain one plasmid and one phage. **[4]**

Q2) Attempt the following:

a) Write note on foot printing using DNase I. **[3]**

b) Explain any one method used for transformation. **[3]**

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

Q3) Answer the following:

a) Define plasmid and cosmid. **[2]**

b) Write note on cloning vectors for insects explain any one in detail. **[3]**

c) Explain role of restriction endonucleases in genetic engineering. **[5]**

P.T.O.

Q4) Answer the following:

a) Write note on types of yeast vectors. Also explain SV40 vector in detail. **[5]**

OR

b) Explain the difference between cDNA and genomic library. **[5]**

SECTION -II

Q5) Answer the following:

a) Name any two recombinant proteins. **[2]**

b) Write note on Invitro mutagenesis. **[4]**

c) Explain principle of RFLP. **[4]**

Q6) Attempt the following:

a) Explain the agrobacterium mediated gene transfer in plants. **[3]**

b) Explain method for producing recombinant factor VIII. **[4]**

c) Give application of PCR. **[3]**

Q7) Answer the following:

a) Briefly describe mi RNA and si RNA. **[2]**

b) Give importance of protein engineering technology. **[3]**

c) Explain process of site directed mutagenesis. **[5]**

Q8) Attempt following:

a) Write note on Antisense RNA and its application in plants. **[5]**

OR

b) Write note on particle gun method and lepofection techniques. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2903

[Total No. of Pages :2

[4724] - 4004

M.Sc.

BIOCHEMISTRY

BCH - 473 : Clinical Nutrition & Food Technology

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

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

Instructions to the candidates:

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

SECTION - I

Q1) Answer the following:

a) Explain the effect of cooking on nutritional quality of food. **[2]**

b) Which toxic chemicals are present in tea? Explain the effect in brief. **[4]**

c) Describe the interrelationship between dietary lipids and cholesterol metabolism. **[4]**

Q2) Attempt the following:

a) What are acidic foods? Explain any one example in detail. **[3]**

b) Describe the effect of food quality on mental development. **[3]**

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

Q3) Answer the following:

a) What is the effect of fermentation on nutritional quality of food. **[2]**

b) Enlist the organs affected by alcohol consumption. Describe the effect of alcohol on each organ in brief. **[3]**

c) Describe the factors affecting on absorption of food. **[5]**

Q4) Attempt any one of the following:

a) Explain the effect of exercise on metabolic adaptation. **[5]**

b) What are the inborn errors of metabolism? Explain the management of any two inborn errors. **[5]**

P.T.O.

SECTION - II

Q5) Answer the following:

a) Differentiate the features of foods obtained from plant and animal origin. **[3]**

b) What do you mean by primary feed stock. **[3]**

c) Explain the principle of food preservation. **[4]**

Q6) Attempt the following:

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

b) Describe the different enzymes used for food processing. **[4]**

c) Explain different food additin. **[3]**

Q7) Answer the following:

a) Explain natural and synthetic sweetness. **[4]**

b) Write a note on neat Tenderisation. **[3]**

c) Explain starch production. **[3]**

Q8) Answer any one of the following:

a) How are genetically modified food is prepared. **[5]**

b) Explain food additives, flavoring agents color and sweetness. **[5]**