Total No. of Questions : 4]

SEAT No. :

P729

[Total No. of Pages : 2

[4326] - 301

M.Sc. (Semester - III)

BIOCHEMISTRY

BCH - 370 : Molecular Biology

(2010 Pattern and 2008 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw neat labelled diagrams wherever necessary.***

Q1) Answer any four of the following: **[20]**

a) What is the mechanism of action of topoisomerase II enzyme on DNA?

b) What is Okazaki fragment? How is it synthesized?

c) Explain the role of Ruv system in resolving Holliday junction.

d) Give an account on RNA polymerase structure and role from E.Coli.

e) Describe structure / features of t-RNA molecule and its role.

Q2) Answer any two of the following : **[20]**

a) Describe in detail spliceosome mediated splicing event in eukaryote system.

b) Discuss the structure and arrangement of nucleosome in chromatin.

c) What is signal hypothesis? Give the detailed mechanism involved in protein targeting.

P.T.O.

Q3) Give a short account on the following (any four) : **[20]**

a) Telomeres and its significance.

b) SOS response.

c) Involvement of plasmids in antibiotic resistance.

d) Antibiotics inhibiting protein biosynthesis in prokaryotes.

e) Cot curve and its significance.

Q4) Write short notes on <u>any four</u> : **[20]**

a) Compare and contrast prokaryotic and eukaryotic ribosomes.

b) Structural aspects of H_1N_1 virus.

c) Targeting of proteins to nucleus.

d) Types of mutations and its consequences.

e) Initiation of transcription in prokaryotes.

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Total No. of Questions : 6]

SEAT No. :

P730

[Total No. of Pages : 2

[4326] - 302

M.Sc. (Semester - III)

BIOCHEMISTRY

BCH - 371 : Medical Biochemistry and Immunology

(2008 & 2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written on separate answer books.***

SECTION - I

(Medical Biochemistry)

Q1) Answer any three of the following: **[15]**

a) Elaborate on Causative agents that lead to carcinogenesis.

b) Discuss the role of clotting factors involved in thrombus formation.

c) Explain the biochemical basis of sickle cell Anaemia.

d) Elaborate on the role of isoenzymes in the diagnosis of heart diseases.

Q2) Answer any three of the following: **[15]**

a) Write the normal composition of CSF and list out two abnormal components that are seen in CSF during pathological conditions.

b) Discuss the mechanism of action of streptomycin and Tetracycline.

c) Elaborate on types of Influenza.

d) Define the term analgesics. Give their mechanism of action with suitable examples.

Q3) Write notes on any two of the following : **[10]**

a) Apoptosis.

b) Hydrolytic enzymes of lysosomes.

c) LSD.

P.T.O.

SECTION - II

(Immunology)

Q4) Answer any three of the following: **[15]**

a) Elaborate on primary and secondary lymphoid organs and their significance with neat diagram.

b) List out different classes of antibodies and give their features.

c) Classify immunodiffusion techniques and elaborate on the procedure of any one such technique.

d) Explain the principle procedure and application of western flotting.

Q5) Answer any three of the following: **[15]**

a) Differentiate between the characteristic feature and production of monoclonal and polyclonal antibodies.

b) Write note on blood group substances.

c) Elaborate on the mechanism of development of any one auto immune disease.

d) Give the characteristics features of anaphylaxis.

Q6) Write notes on any two of the following : **[10]**

a) Graft rejection.

b) Immunodeficiency diseases.

c) Interferons.

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Total No. of Questions : 4]

SEAT No. :

P731

[Total No. of Pages : 2

[4326] - 303

M.Sc. (Semester - III)

BIOCHEMISTRY

BCH - 372 : Neurochemistry

(2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw necessary diagrams wherever necessary.***

Q1) Answer any four of the following: **[20]**

a) Describe the ionic basis for inhibitory and excitatory post-synaptic potentials and how these changes can alter synaptic transmission.

b) Compare conduction velocities in a compound nerve, identifying how the diameter and myelination lead to differences in conduction velocity, and the use of these differences to classify neurons.

c) Describe the anatomy and functions of the major ascending and descending spinal cord tracts, including any crossing of midline.

d) Differentiate Chemically Gated and Voltage-Gated Channels?

e) What are the characteristics of a neurotransmitter.

Q2) Attempt any two of the following : **[20]**

a) Describe the overall function of the basal ganglia in movement control and initiation in association with medial and lateral motor systems.

b) Describe ionic basis of an action potential.

c) Explain the mechanisms proposed for short term and long-term memory storage.

P.T.O.

Q3) Answer <u>any two</u> of the following : **[20]**

a) Draw a cross section of the spinal cord and discuss the organization of the sensory and motor components of gray matter. Describe the somatotropic arrangement of motor neuron pools.

b) Explain the effects of demyelination on action potential propagation and nerve conduction.

c) Describe the synthetic pathways, inactivation mechanisms and neurochemical anatomy and mechanisms of receptor transduction for the following neurotransmitters:

i) Serotonin

ii) Histamine

Q4) Write short notes on <u>any four</u> : **[20]**

a) Basilar membrane.

b) Synaptic plasticity.

c) Memory processing.

d) Rod and cone cells.

e) Sensory circuits.

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Total No. of Questions : 4]

SEAT No. :

P732

[Total No. of Pages : 2

[4326] - 304

M.Sc. (Semester - III)

BIOCHEMISTRY

BCH - 373 : Biochemical Toxicology

(2008 & 2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to right indicate full marks.***

Q1) Answer any five of the following : **[20]**

a) Explain the Dose-Response relationship.

b) What does it mean by additive, synergistic, potentiation and antagonistic effects?

c) Animal develops tolerance against the toxicants. Explain with suitable examples.

d) How teratogenic potential of chemical is evaluated?

e) How soil and water pollutants are degraded?

f) What are the toxic effects of ozone and peroxyacetyl nitrate?

g) Give the biochemical reactions involved in parathion biotransformation.

Q2) Attempt any five of the following : **[20]**

a) Give the forensic applications of toxicology.

b) Give the composition and adverse effects of lizard venom.

c) Explain the role Cytochrome P-450 in xenobiotic metabolism.

d) Give the factors that affect the metal toxicity.

e) What is the fate of heavy metal lead in human body?

f) Explain the adverse effects caused by methanol and chloroform.

g) Reductive metabolism of xenobiotics catalyzed by Cytochrome P-450 leads to cellular injury. Explain.

P.T.O.

Q3) Answer any four of the following : **[20]**

a) Give overall impact of chlorinated insecticides on ecosystem.

b) Compare the inhibition of acetylcholinesterase caused by organophosphrous and carbamate insecticides.

c) Distinguish between venomous and poisonous animals.

d) Explain the mechanism of biotransformation catalyzed by N-acetyltransferase.

e) What are the local toxic effects of organophosphrous insecticides.

f) Explain the carcinogenicity of arsenic.

Q4) Give the pathogenesis and clinical manifestations of any four of the following: **[20]**

a) Skeletal system and cardiovascular effects of cadmium exposure.

b) Hematopoietic effects lead.

c) Hypotension and shock due to snake venom.

d) Farmer's lung.

e) Bile stasis.

f) Fatty liver.

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Total No. of Questions : 6]

SEAT No. :

P733

[Total No. of Pages : 3

[4326] - 401

M.Sc. (Semester - IV)

BIOCHEMISTRY

BCH - 470 : Biochemical Endocrinology and Tissue culture (2008 Pattern)

Biochemical Endocrinology and Plant Biochemistry (2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Draw neat diagram wherever necessary.*
3) *Figures to the right hand side indicate full marks.*
4) *Answers to the two sections should be written on separate answer books.*

SECTION - I

Biochemical Endocrinology

Q1) Answer any three of the following: **[15]**

a) Briefly describe the production of T_4 & T_3 including the following terms:
   i) iodide / iodine.
   ii) thyroglobulin (TGB)
   iii) colloid.
   iv) tyrosine residues.
   v) thyroxine - binding globulin (TBG).

b) Write note on the biological role of posterior pituitary hormones.

c) What are the hormones secreted by the adrenal cortex? What are their respective functions?

d) Describe the mechanism to control the secretion of insulin.

Q2) Attempt any three of the following: **[15]**

a) What are prostaglanding? Write note on their functions.

b) Elaborate on the biosynthesis of male and female sex hormones.

c) What are the clinical manifestations of growth hormone deficiency?

d) Write a note on gastrointestinal hormones.

P.T.O.

Q3) Answer any two of the following : **[10]**

a) Write a note on zinc fingurs.

b) How G-proteins regulate the activity of adenylate cyclase?

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

SECTION - II

Tissue Culture (Old)

Q4) Answer any three of the following: **[15]**

a) Explain the role of growth regulators.

b) Explain the process of micropropogation.

c) Give the various ways of sterilization.

d) Describe the process of anther culture.

e) Explain the term cybrides.

Q5) Answer any three of the following: **[15]**

a) Give the advantages and disadvantages of natural media.

b) What is primary culture? How it is obtained?

c) Give the importance and limitation of organ culture.

d) Discuss the characteristics of transformed cells.

e) Describe the various culture methods involved in animal tissue culture.

Q6) Write short notes on any two of the following : **[10]**

a) Cloning.

b) Cell preservation.

c) Hairy root culture.

d) Secondary metabolites.

SECTION - II

Plant Biochemistry (New)

Q4) Attempt any three of the following: **[15]**

a) Localization of photosystems in thylakoid membrane.

b) Role of phosphorous in plant growth.

c) Functions of Gibberellic acid.

d) Calvin cycle.

e) Role of ethylene oxide in fruit ripening.

Q5) Explain the following (any three) : **[15]**

a) Symbiotic nitrogen fixation.

b) Micropropagation.

c) Somatic hybridization.

d) Anthocyanins.

e) Role of magnesium in plant growth.

Q6) Write notes on any two : **[10]**

a) CAM metabolism.

b) Formation of callus.

c) Pectins.

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Total No. of Questions : 4]

SEAT No. :

P734

[Total No. of Pages : 2

[4326] - 402

M.Sc. (Semester - IV)

BIOCHEMISTRY

BCH - 472 : Genetic Engineering

(2008 & 2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right hand side indicate full marks.***

Q1) Answer the following (any four) : **[20]**

a) Give the restriction sites of Eco RI, Hae III, Eco RV, Bam HI and Hind III.

b) Explain with suitable example Isoschizomers.

c) Write short note on reverse transcriptase.

d) Explain the use of RNase H in DNA cloning.

e) Write short note on : Structure of pBR322.

Q2) Answer the following (any two) : **[20]**

a) What is Molecular evolution? Discuss this mechanism in related proteins with suitable examples.

b) Describe in detail the genetic map of Ti plasmid. Add a note on total genes, their products, functions and use in plant genetic engineering.

c) What is site directed mutagenesis? Discuss with suitable examples.

Q3) Answer the following (any two) : **[20]**

a) Genetic engineering is boon to the mankind .Support this statement with suitable examples.

b) Give suitable methods for screening of recombinant DNA clones.

c) Explain in detail di-deoxy method of DNA sequencing.

P.T.O.

Q4) Write short notes (any four) : **[20]**

a) DDRT PCR.

b) Microarray.

c) Genomic library.

d) Shuttle vector.

e) Role of maternal genes.

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Total No. of Questions : 6]

SEAT No. :

P735

[Total No. of Pages : 2

[4326] - 403

M.Sc. (Semester - IV)

BIOCHEMISTRY

BCH - 471 : Fermentation and Enzyme Technology and Food Technology

(2008 & 2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Answers to both the sections should be written in separate answer books.***
2) ***Figures to the right indicate full marks.***

SECTION - I

Fermentation Technology (Old & New)

Q1) Answer any three of the following: **[15]**

a) What are different criteria for isolation of industrially important microorganisms?

b) What are various methods of feedback control?

c) How will you proceed for isolation of auxotrophic mutant?

d) How will you choose a recovery process during fermentation?

e) What is the effect of oxygen supply on product formation?

Q2) Explain the following: (any three) **[15]**

a) Continuous culture.

b) Media optimization.

c) Nitrogen source in fermentation.

d) Effect of inducers on fermentation.

e) Physical methods of effluent treatment.

Q3) Write notes on : any two **[10]**

a) Role of Chromatography in product recovery.

b) Development of inoculum for bacterial processes.

c) Aeration.

P.T.O.

SECTION - II

Food Technology

Q4) Answer any three of the following: **[3 x 5 = 15]**

a) Discuss flavouring agents used in food industries.

b) Elaborate on monitoring of food quality.

c) Discuss Various food additives

d) Give brief account on artificial sweetners.

Q5) Answer any three of the following: **[3 x 5 =15]**

a) Elaborate on enzymes used in fruit juice technology.

b) Discuss single cell protein and its importance in food industry.

c) Classify foods based on plant and animal sources.

d) Discuss types of toxins with their identification methods.

Q6) Write notes on any two of the following : **[2 x 5 =10]**

a) Primary feed stock.

b) Genetically modified food.

c) Food preservation.

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Total No. of Questions : 6]

SEAT No. :

P723

[Total No. of Pages : 2

[4326] - 101
M.Sc. (Semester - I)
BIOCHEMISTRY
BCH - 170 : Biomolecules
(2008 & 2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written on separate answer books.***

SECTION - I

Q1) Attempt any five of the following : **[15]**

a) How are macromolecules formed from their monomeric subunits? Give examples.

b) List out the biological buffers and give their significance.

c) Write note on source, structure and biological functions of Ascorbic acid.

d) Differentiate between anomers and epimers of glucose.

e) What are reducing and non-reducing sugars. Give examples.

f) Comment on amphipathic nature of phospholipids.

Q2) Attempt any three of the following : **[15]**

a) Give one example and structure of the following.

i) Phosphosphingolipid ii) Homodisacchoride

iii) Saturated fattyacid iv) Aminosugar

v) Ketohexose

b) What are fat soluble vitamins? Give their significance.

c) Elaborate on the major class and subclasses of lipids with examples.

d) Explain the reaction of glucose with phenyl hydrazine and Bromine water.

P.T.O.

Q3) Write notes on <u>any two</u> : **[10]**

a) Coenzymes.

b) Rancidity.

c) Mutarotation.

SECTION - II

Q4) Attempt <u>any five</u> of the following **[15]**

a) Explain the reactions of aminoacid with Ninhydrin and Sanger's.

b) Differentiate between α-helix and β-pleated sheet structures.

c) Comment on acid - base properties of aminoacid.

d) List out various functions of proteins.

e) Write note on denaturation of proteins.

f) How are dipeptides formed? Give structure of Ala-Tyr.

Q5) Attempt <u>any three</u> of the following : **[15]**

a) Classify amino acids. Give two examples of each class.

b) Discuss the forces that stabilise tertiary structure of proteins.

c) Explain the titration curve of acidic amino acids.

d) How are 'N' an 'C' terminal aminoacids determined in a polypeptide?

Q6) Write notes on <u>any two</u> : **[10]**

a) Quaternary structure

b) Essential and Nonessential aminoacids.

c) Solid phase Synthesis.

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Total No. of Questions : 6]

SEAT No. :

P724

[Total No. of Pages : 2

[4326] - 102
M.Sc. (Semester - I)
BIOCHEMISTRY
BCH - 171 : Enzymology and Biophysical Techniques
(2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Answers to both the sections should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***

SECTION - I
(Enzymolgy)

Q1) Answer any three of the following : **[15]**

a) What is substrate cycle? Explain with suitable example.

b) Discuss and two factors leading to rate enhancement of enzyme catalyzed reactions.

c) Explain the mechanism of action of triosephosphate isomerase.

d) Define the terms :

i) apoenzyme ii) holoenzyme

iii) allosteric site iv) cofactor

Q2) Answer any three of the following : **[15]**

a) Discuss in detail effect of substrate concentration on enzyme catalyzed reaction.

b) Explain the various conditions under which the enzyme-substrate complex is stabilized to determine the mechanism of enzyme catalysis by X-ray crystallography.

c) How activity of an enzyme is regulated by irreversible changes in covalent structure? Explain with example.

d) Study of pre-steady state kinetics determines the mechanism of enzyme catalysis. Explain.

P.T.O.

Q3) Answer any two of the following : **[10]**

a) How the rate of degradation (K_d) of the enzyme is measured?

b) What is positive co-operativity? Explain with suitable example.

c) Why is chymotrypsin most active at pH 8? Explain its mechanism.

SECTION - II

(Biophysical Techniques)

Q4) Answer any three of the following. **[15]**

a) Describe DNA cellulose and MAK chromatography.

b) Write a note on SDS-PAGE.

c) How does HPTLC give rapid separation and higher resolution?

d) What do you understand the term 'finger-printing'? List out its application.

Q5) Answer any three of the following : **[15]**

a) Draw the schematic diagram of a UV-VIS spectrometer and explain the instrumentation.

b) Explain the principle and application of Hydroxyapatite Chromatography.

c) How can molecules with the same charge at varying amounts be separated by chromatography?

d) Explain any two applications of dialysis.

Q6) Answer any two of the following : **[10]**

a) What are the applications of purified enzymes? How enzymes are separated on the basis of their solubility?

b) How molecular weight of a protein can be determined by gel chromatography.

c) What is restriction mapping? Explain with suitable example.

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Total No. of Questions : 6]

SEAT No. :

P725

[Total No. of Pages : 2

[4326] - 103
M.Sc. (Semester - I)
BIOCHEMISTRY
BCH - 172 : Microbiology and Cell Biochemistry of Eukaryotes
(2010 Pattern & 2008 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***Answers to the both sections should be written on separate answer books.***
2) ***All questions are compulsory.***
3) ***Figures to right indicate full marks.***

SECTION - I
(Microbiology)

Q1) Answer the following **(any three)** : **[15]**

a) What are steps involved in the process of viral infection?

b) What do you understand from growth curve of bacteria? Add a note on its uses.

c) Which gaseous agent is most effective in control of microorganisms? Give its mode of action.

d) What is the mode of action of cholera toxin?

e) Why oxygen is toxic to anaerobic bacteria?

Q2) Explain **any three** of the following : **[15]**

a) Production of L-lysine.

b) Preservation of bacterial pure cultures.

c) Bacterial endotoxins.

d) Spread plate method for isolation of pure culture.

e) Bright field and dark field microscopy.

P.T.O.

Q3) Write short notes on **(any two)** : **[10]**

a) Contributions of Louis Pasteur.

b) Animal viruses.

c) Production of lactic acid.

SECTION - II

(Cell Biochemistry of Eukaryotes)

Q4) Attempt any three of the following : **[15]**

a) How are organelles separated by subcellular fractionation techniques.

b) Elaborate on various phases of mitosis and give its significance.

c) Draw the structure of plant cell wall. Write note on its features and functions.

d) Write note on cell-cell communications in plants.

Q5) Attempt any three of the following : **[15]**

a) Write note on specific cell aggregation in sponges.

b) Differentiate between Gap and Tight junctions.

c) Elaborate on fluid-mosaic model of plasma membrane.

d) Explain the principle of density gradient centrifugation and give details of the applications in Biochemistry.

Q6) Write note on any two of the following : **[10]**

a) Organogenesis.

b) Marker enzymes.

c) Extracellular matrix.

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Total No. of Questions : 6]

SEAT No. :

P726

[Total No. of Pages : 2

[4326] - 201
M.Sc. (Semester - II)
BIOCHEMISTRY
BCH - 270 : Bioenergetics and Metabolism
(2008 & 2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right side indicate full marks.***
3) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

Q1) Answer any five of the following : **[15]**

a) "Although O_2 is not involved in any step of TCA cycle yet the cycle is aerobic". Explain.

b) Why animals cannot effect the net conversion of lipid to carbohydrates while plant or microorganism can? Illustrate your answer with enzyme-catalysed reactions involved in the net conversion of lipid to carbohydrate.

c) Write note on high energy compounds.

d) Differentiate between C_3 and C_4 pathways.

e) Tabulate the glycogen storage diseases with details of defective enzymes and clinical features.

f) What is Pasteur effect?

Q2) Answer any three of the following : **[15]**

a) Outline the steps involved in pentose phosphate pathway.

b) Explain all the reactions involved in the conversion of lactic to glucose.

c) Describe non-cyclic photophosphorylation and its significance.

d) Discuss chemiosmotic hypothesis of Peter mitchell in the formation of ATP.

P.T.O.

Q3) Answer any two of the following : **[10]**

a) Explain the role of hormones in the regulation of glycogenesis and glycogenolysis.

b) Discuss the amphibolic role of TCA cycle.

c) Describe the reactions involved in the formation of Ascorbic acid from glucose.

SECTION - II

Q4) Answer any five of the following : **[15]**

a) Write note on phenylketonuria and Alkaptonuria.

b) Give the significance of decarboxylation of amino acids with suitable examples.

c) What is the role of ribonucleotide reductase in our body?

d) What are ketone bodies? How are they formed?

e) List out the steps involved in the biosynthesis of polyamines.

f) How is β-alanine formed during pyrimidine catabolism?

Q5) Answer any three of the following : **[15]**

a) Outline the cycle of reactions that converts Ammonia to Urea.

b) Explain β-oxidation of palmitic acid with energetics.

c) Discuss the biosynthesis of phenylalanine.

d) Elaborate on the regulation of biosynthesis of purine and pyrimidine nucleotides.

Q6) Answer any two of the following : **[10]**

a) How are triglycerides prepared in our body.

b) Explain the role of CDP in phospholipid biosynthesis.

c) Describe the steps involved in formation of Uric acid.

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Total No. of Questions : 4]

SEAT No. :

P727

[Total No. of Pages : 2

[4326] - 202
M.Sc. (Semester - II)
BIOCHEMISTRY
BCH - 271 : Techniques for Characterization of biomolecules
(2010 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right side indicate full marks.***

Q1) Attempt any four of the following : **[20]**

a) Distinguish between boundary and band sedimentation.

b) How sensitivity of autoradiography is achieved?

c) Draw the schematic diagram of NMR and explain the instrumentation.

d) What is polarization of fluorescence? List the basic rules for interpretation.

e) Explain the special uses of LCMS in biology and biochemistry.

Q2) Attempt any four of the following : **[20]**

a) Describe the applications of ESR.

b) Define and give application of partial specific volume. How it is determined by pycnometer?

c) What is the effect of addition of ethidium bromide on viscosity of DNA.

d) Explain the types of radiations used in Biochemistry.

e) Explain the relationship between electrical response and rate of diffusive flux.

P.T.O.

Q3) Answer any <u>two</u> of the following : **[20]**

a) Give the principle and application of IR spectroscopy.

b) Explain the major applications of biosensors in environmental pollution monitoring.

c) Describe briefly the theory of atomic absorption spectroscopy. what information can be obtained from this spectroscopy? Explain any one application.

Q4) Write short notes : (any four) **[20]**

a) X-ray diffraction.

b) ORD and CD.

c) MALDI- TOF-MS.

d) Immunosensor.

e) Autoradiography.

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Total No. of Questions : 6] **[Total No. of Pages : 2**

P727

[4326] - 202
M.Sc. (Semester - II)
BIOCHEMISTRY
BCH - 271 : Biophysical Techniques
(2008 Pattern)

Time : 3 Hours] ***[Max. Marks : 80***

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right side indicate full marks.***

SECTION - I

Q1) Answer any three of the following : **[15]**

a) Describe briefly the theory of NMR spectrometry. What information can be obtained from NMR absorption peaks?

b) Explain the properties of ion-exchangers.

c) Describe the different detector system which are used in Gas. Liquid chromatography.

d) How mixture of DNA is separated by electrophoresis.

Q2) Attempt any three of the following : **[15]**

a) Explain the process of reverse dialysis and its application.

b) How is hydroxyapatite chromatography superior to other chromatographic method? Explain the method briefly.

c) Explain in brief disc electrophoresis. How was it used to analyze the proteins synthesized during λ phage infection of E. Coli.

d) Briefly explain the principle of gas chromatography and mention its advantages and enlist its uses.

P.T.O.

Q3) Answer any <u>two</u> of the following : **[10]**

a) Explain the principle and application of isoelectric focusing.

b) Write short note on DNA - cellulose chromatography.

c) Describe any two applications of nitrocellulose filters in binding assay.

SECTION - II

Q4) Answer any <u>three</u> of the following : **[15]**

a) Differentiate between preparative and analytical centrifuges.

b) What is the significance of diffusion coefficient? How it is measured by boundry sedimentations.

c) Discuss various types of viscometer used in biochemistry.

d) Write in brief free radicals in water.

Q5) Attempt any <u>three</u> of the following : **[15]**

a) Enlist the factors governing choice of isotope. Explain any one.

b) Write short note on autoradiography.

c) What is quenching? List out the factors that are involved in quenching.

d) What are the factors affecting sedimentation velocity? Explain.

Q6) Answer any <u>two</u> of the following : **[10]**

a) What are gamma counters? Give their uses.

b) Write short note on zonal centrifugation.

c) What is partial specific volume? Describe Linderstorm-Lang density gradient column.

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Total No. of Questions : 6]

SEAT No. :

P728

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M.Sc. (Semester - II)

BIOCHEMISTRY

BCH - 273 : Membrane Biochemistry and Genetics (2010)

Membrane Biochemistry and Nucleic acids (2008)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

(Membrane Biochemistry)

Q1) Answer any three of the following : **[15]**

a) Structural features and role of gramicidin as a transport antibiotic.

b) Lipids as a major constituent of biological membranes.

c) Structure and significance of bacterial cell wall.

d) Types of transport process. Compare these with respect to energetics involved.

Q2) Answer any three of the following : **[15]**

a) Sodium channel and its significance.

b) Calcium pump and its physiological significance.

c) ABC transporters and their role.

d) Cotransport of chloride and bicarbonate in humans.

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Q3) Write short notes on <u>any two</u> : **[10]**

a) Phosphotransferase system.

b) Gap junctions and its significance.

c) Nuclear pore complex.

SECTION - II

Nucleic Acids (Old) Genetics (New)

Q4) Answer <u>any three</u> of the following : **[3 × 5 = 15]**

a) Discuss the experimental evidence that prove DNA as genetic material.

b) Differentiate between transformation and transduction.

c) Define vectors. Give their significance in gene cloning.

d) Enlist the salient features of Watson and Crick model of DNA.

Q5) Answer <u>any three</u> of the following : **[3 × 5 = 15]**

a) Elaborate on Messelson and stahl experiment and its interpretation.

b) Comment on denaturation and renaturation of DNA.

c) Explain the significance of structural and regulatory genes of Lac. Operon.

d) Enlist the features of genetic code.

Q6) Write note on <u>any two</u> of the following : **[2 × 5 = 10]**

a) Complementation tests.

b) Mutation and genetic disorders.

c) Mendelian laws of inheritance.

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