Total No. of Questions : 8]

SEAT No. :

P349

[Total No. of Pages : 2

[5831]-101
M.Sc.
BIOCHEMISTRY
BCH-111 : Biomolecules
(Organic Chemistry of Living Beings)
(2019 Pattern) (Semester - I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Q.1 and Q.5 are compulsory and carry 11 marks each.***
2) ***Attempt any two questions from Q.2 to Q.4 and two questions from Q.6 to Q.8.***
3) ***Answers to the two sections should be written in separate answer books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Answer the following questions. **[11]**

a) Explain the reaction of osazone formation of sugars. **[3]**

b) Enumerate the properties of water and write a note on interaction of water with biomolecules. **[4]**

c) Discuss the biochemical function and deficiency of vitamin D. **[4]**

Q2) Write a short note : **[12]**

a) Role of lipids in cell membrane. **[4]**

b) Monosaccharide and their classification. **[4]**

c) Triacyl glycerol and their significance. **[4]**

Q3) Answer the following questions. **[12]**

a) What are amino sugars and deoxy-sugars? Give their significance. **[4]**

b) Explain the structure and role of glycogen in animals. **[4]**

c) Describe the biochemical functions of NAD^+ and TPP. **[4]**

P.T.O.

Q4) Answer the following questions (Any four) : **[12]**

a) Describe biological functions of storage lipids. **[3]**

b) Give the structure and functions of sucrose. **[3]**

c) Write the structure and functions of any one of the hetero polysaccharide. **[3]**

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

e) Define mutarotation and enantiomers. **[3]**

SECTION - II

Q5) Answer the following questions. **[11]**

a) What are conjugated proteins? Give examples. **[3]**

b) Describe Edman reaction for protein sequence analysis. **[4]**

c) Give and explain the titration curve of glycine. **[4]**

Q6) Write a short note : **[12]**

a) α - helix **[4]**

b) Ramachandran plot **[4]**

c) Peptide synthesis **[4]**

Q7) Answer the following questions. **[12]**

a) Explain the quaternary structure of proteins with examples. **[4]**

b) Discuss the classification of amino acids based on R groups. **[4]**

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

Q8) Answer the following questions. (any four) **[12]**

a) Draw the structure of L-leucine, L-Valine and L-isoleucine. **[3]**

b) What is sanger reagent? Give its significance. **[3]**

c) List the types of amino acids based on polarily with examples. **[3]**

d) Discuss the primary structure of proteins. **[3]**

e) Give different chemical properties of amino acids. **[3]**

Total No. of Questions : 8]

SEAT No. :

P350

[Total No. of Pages : 2

[5831]-102
M.Sc.
BIOCHEMISTRY
BCH-112 : Physical Biochemistry
(2019 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer to the two sections should be written in separate answer books.***
2) ***Q.1 and Q.5 are compulsory.***
3) ***Attempt any two questions from Q.2 to Q.4 and any two from Q. 6 to Q.8.***
4) ***Figures to the right side indicate full marks.***

SECTION - I

Q1) Answer the following questions : **[11]**

a) Describe in detail any one application of nitrocellulose filters. **[3]**

b) Differentiate between boundary & band sedimentation. **[4]**

c) Differentiate between partition & adsorption chromatography. **[4]**

Q2) Write short note on following : **[12]**

a) Analytical ultracentrifuge. **[4]**

b) ISO electric focusing. **[4]**

c) Ostwalds capillary viscometer. **[4]**

Q3) Answer the following questions : **[12]**

a) Describe any two methods of immobilization of ligands. **[4]**

b) Explain principle of agarose gel electrophoresis. **[4]**

c) Explain Instrumentation & working of HPLC. **[4]**

P.T.O.

Q4) Attempt the following questions (any four) : **[12]**

a) What physical characteristics of biomolecules influence it's rate of movement in an electrophoresis matrix? **[3]**

b) What is the effect of macromolecules on viscosity of solution. **[3]**

c) Give the application of biosensor. **[3]**

d) What is ion exchange chromatography? Name types of ion exchangers. **[3]**

e) Give the principle of DNA-cellulose chromatography. **[3]**

SECTION - II

Q5) Answer the following questions : **[11]**

a) Define optical density. How is absorbance related to transmittance. **[3]**

b) Define fluorescence? What is the relation between extrinsic fluorescence & energy transfer. **[4]**

c) What are advantages of LCMS & GCMS. **[4]**

Q6) Write a short note on following : **[12]**

a) Atomic Absorption spectroscopy. **[4]**

b) MALDI. **[4]**

c) Spectrofluoremetry. **[4]**

Q7) Answer the following questions : **[12]**

a) Describe theory of NMR spectroscopy. What information can be obtained from NMR peak. **[4]**

b) Explain instrumentation & working of mass spectrometer. **[4]**

c) Give the principle and instrumentation of optical rotatory dispersion. **[4]**

Q8) Attempt the following questions (any four) : **[12]**

a) Define auxochrome. How it is useful in spectroscopy technique. **[3]**

b) Name the extrinsic and intrinsic fluores used for protein studies. **[3]**

c) What are the different types of chemical ionisation methods. **[3]**

d) Give the applications of IR spectroscopy. **[3]**

e) What is polarisation of fluorescence. **[3]**

⌘⌘⌘

Total No. of Questions : 8]

SEAT No. :

P351

[Total No. of Pages : 2

[5831]-103

M.Sc. (Biochemistry)

BCH - 113 : Cell Biology & Membrane Biochemistry

(2019 Pattern) (Semester - I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Q.1 & Q.5 are compulsory and carry 11 marks each.***
2) ***Attempt any two questions from Q.2 to Q.4 and two from Q.6 to Q.8.***
3) ***Answer to the two sections should be written in separate answer book.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Answer the following : **[11]**

a) Mentioned specific stain are marker for nucleus.

b) What are the function of lysome?

c) What are cell function? Explain its types.

Q2) Short note : **[12]**

a) Cell adhesion molecules

b) Mitosis

c) Cytoskeleton

Q3) Answer the following : **[12]**

a) Describe the process of Fertilization.

b) Explain plant tissues organization.

c) Explain how cyclins & cyclin-dependent kinases control cell cycle?

Q4) Answer the following (any 4) **[12]**

a) Illustrate the process of cytokinases.

b) Explain the function of extracellular matrix & mention two protein associated with it.

c) Describe the structure & function of plasmodesmata.

d) Describe the process of meosis.

e) Comment on subcellular fractanation.

P.T.O.

SECTION - II

Q5) Answer the following : **[11]**

a) What is secondary active transport.

b) What is valinomycin? Explain its mode of action.

c) What are the component of biological membrane? How its fluidity regulated.

Q6) Short note : **[12]**

a) Sodium potassium Atpase

b) Group translocation

c) Membrane associated diseases

Q7) Answer the following : **[12]**

a) What are ABC transporter? How do they function?

b) Explain fluid-mosaic model & comment on membrane asymmetry.

c) Explain how protein toxin are transported across cell membranes.

Q8) Answer the following (any 4) **[12]**

a) Describe the mechanism of voltage gated ion channel.

b) Comment on receptor mediated endocytosis with suitable example.

c) What do you understand about antiport, symport, uniport.

d) Explain the working of ATP-ADP exchanger.

e) Describe the process of exocytosis & its importance in signaling.

Total No. of Questions : 4]

SEAT No. :

P352

[Total No. of Pages : 2

[5831]-104
M.Sc. (Biochemistry)
BCH - 114 : Enzymology
(2019 Pattern) (Semester - I)

Time :2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory and carries 11 marks.***
2) ***Attempt any two questions from Q.2 to Q.4.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following question. **[11]**

a) What are zymogens? Give example and importance of zymogens. **[3]**

b) Describe the mechanism of reaction catalyzed by Chymotrypsin. **[4]**

c) Give the evidence for enzyme catalyzing reaction by double displacement method. **[4]**

Q2) Write a short note. **[12]**

a) Lineweaver-Burk plot and Hanes plot with equation. **[4]**

b) Enzyme inhibition. **[4]**

c) Pre-steady state kinetics and its measurement. **[4]**

Q3) Answer the following questions. **[12]**

a) Explain Acid basis catalysis for enzymatic reaction with suitable example. **[4]**

b) Discuss site directed mutagenesis with suitable examples. **[4]**

c) Describe in detail about chemical triad in chymotrypsin. **[4]**

P.T.O.

Q4) Answer the following questions. (Any 4) **[12]**

a) What are group, low and absolute specific enzymes? Give one example for each. **[3]**

b) Explain ping-pong mechanism with suitable example. **[3]**

c) Derive Michael's - Menten equation based on equilibrium assumption. **[3]**

d) Define apoenzyme, coenzyme and Isoenzymes. **[3]**

e) What is enzyme Turnover? Give its significance. **[3]**

□□□

Total No. of Questions : 8]

SEAT No. :

P353

[Total No. of Pages : 3

[5831]-201
M.Sc. (Part - I) (Biochemistry)
BCH - 211 : Metabolism (Reactions of Biomolecules)
(2019 Pattern) (Semester - II)

Time :3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer to the two sections should be written in separate answer books.***
2) ***Question number 1 and 5 are compulsory. Out of remaining attempt any two questions (Q .No. 2 to 4) from section I and any two questions(Q.No 6 to 8) from section II.***
3) ***figures to the right side indicate full marks.***
4) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I
[CARBOHYDRATE AND LIPID METABOLISM]

Q1) a) Attempt any four of the following : **[4 × 2 = 8]**

i) List out energy rich compounds in the body.

ii) Which enzymes forms fatty acid synthase complex.

iii) Write the reaction with enzymes, coenzyme involve in the conversion of pyruvate to acetyl-CoA.

iv) What are ketone bodies?

v) Give the relationship between tree energy, Entropy and Enthalphy.

b) Discuss the role of glycogenin in the synthesis of glycogen. **[3]**

Q2) Attempt the following : **[12]**

a) Explain entry of glycogen in glycolysis. **[4]**

b) Write about oxidation of palmitic acid with energetics. **[4]**

c) Explain in detail ‘Q cycle’. **[4]**

P.T.O.

Q3) Attempt the following : **[12]**

a) With the help of diagram Explain 'ETC'. **[4]**

b) Discuss the preparatory phase of glycolysis. **[4]**

c) Write the energetic equation of complete oxidation of one glucose molecule. **[2]**

d) What are the significances of glyoxylate cycle. **[2]**

Q4) Attempt the following : **[12]**

a) What is substrate level phosphorylation? Explain with example. **[3]**

b) Explain the types of oxidation of fatty acid. **[3]**

c) Why TCA cycle is called as Amphoteric. **[3]**

d) How gluconeogenesis is regulated. **[3]**

SECTION - II
[AMINO ACID AND NUCLEOTIDE METABOLISM]

Q5) a) Attempt any four of the following : **[4 × 2 = 8]**

i) Define the term proteolysis.

ii) What do you mean by salvage pathway.

iii) How Ribose 5 phosphate is converted to 5-PRPP. Write reaction.

iv) Write the conversion of histidine $\rightarrow$ histamine.

v) What is reaction of conversion of dump $\rightarrow$ dTMP

b) Explain the role of Tetra-hydrofolate with reaction. **[3]**

Q6) Attempt following : **[12]**

a) Draw a flow chart describing, degradation of pyrimidine nucleotide. **[6]**

b) Describe urea cycle in detail. **[4]**

c) Write the reaction of IMP $\rightarrow$ GMP **[2]**

Q7) Attempt following : **[12]**

a) What is oxidative deamination? Explain with the help of reaction. **[4]**

b) Write the reaction in the following conversion,

α ketoglutrate $\rightarrow$ glutamate $\rightarrow$ glutamine **[4]**

c) Explain the salvage pathway of purine nucleotide synthesis. **[4]**

Q8) Attempt following : **[12]**

a) How pyrimidine nucleotide biosynthesis is regulated. **[4]**

b) How urea cycle is regulated. **[4]**

c) Write the following conversions : **[4]**

i) Phenylalanine $\rightarrow$ Tyrosine

ii) Chorishmate $\rightarrow$ Tyrosine

Total No. of Questions : 8]

SEAT No. :

P354

[Total No. of Pages : 2

[5831]-202

M.Sc. (Part - I)

BIOCHEMISTRY

BCH-212 : Genetics (Chemistry of Nucleic Acids)

(2019 Pattern) (Semester - II)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Q.1 and Q.5 are compulsory and carry 11 marks each.***
3) ***Attempt any two questions from Q.2 to Q.4 and two questions from Q.6 to Q.8.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Answer the following. **[11]**

a) Explain alleles and pseudoalleles with one example each. **[3]**

b) What are different types of RNA? Explain the structure and function of each. **[4]**

c) Explain gene interactions with example. **[4]**

Q2) Write a short note on : **[12]**

a) Linkage **[4]**

b) Structure of DNA **[4]**

c) Mapping of *E-coli* Chromosome **[4]**

Q3) Answer the following. **[12]**

a) Describe lac operon. **[4]**

b) Explain the determination of gene order with suitable example. **[4]**

c) What is Mendel's first law of inheritance? Explain the terms-dominance, incomplete dominance and co-dominance. **[4]**

P.T.O.

Q4) Answer any four of the following. **[12]**

a) Explain denaturation and renaturation of DNA. **[3]**

b) Explain epistasis with example. **[3]**

c) Explain Mendel's law of independent assortment. **[3]**

d) Explain ABO blood grouping in human being. **[3]**

e) Explain types of crossing over. **[3]**

SECTION - II

Q5) Answer the following. **[11]**

a) Define mutation and mutagens. **[2]**

b) Describe genetic variation and genetic drift. **[4]**

c) Explain genetic approaches to Alzheimer's and diabetes. **[5]**

Q6) Write a short note on. **[12]**

a) Hardy - Weinberg equilibrium **[4]**

b) Auxotropic mutant isolation **[4]**

c) Human teratogenesis **[4]**

Q7) Answer the following. **[12]**

a) What is pedigree analysis? Explain the signs & symbols used in pedigree analysis. **[4]**

b) Explain neutral evolution and balancing selection. **[4]**

c) Explain clinical genetics. **[4]**

Q8) Answer any four of the following. **[12]**

a) Explain transformation. **[3]**

b) Explain mating systems **[3]**

c) Explain Trisomy **[3]**

d) Explain Fishers theorem **[3]**

e) Explain types of migration **[3]**

Total No. of Questions : 8]

SEAT No. :

P355

[Total No. of Pages : 2

[5831]-203
M.Sc. (Part - I) (Semester - II)
BIOCHEMISTRY
BCH-213 : Plant Biochemistry
(2019 Pattern)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Q.1 and Q.5 are compulsory and carry 11 marks each.***
2) ***Attempt any two questions from Q.2 to Q.4 and two questions from Q.6 to Q.8.***
3) ***Answers to the two sections should be written in separate answer books.***
4) ***Figures to the right indicate full marks.***

SECTION - I

Q1) Answer the following. **[11]**

a) What is a light harvesting complex?

b) Explain the mechanism of adaptation towards abiotic stress.

c) What is seed dormancy? Explain its types.

Q2) Short Notes. **[12]**

a) Electron flow during light reaction.

b) Pharmaceutical and Nutraceutical values of plants.

c) Plant diseases.

Q3) Answer the following. **[12]**

a) Comment an plant pests & their management.

b) Describe the biochemical process of seed germination.

c) Comment on source-sink relationship in plants.

P.T.O.

Q4) Answer the following (any 4). **[12]**

a) Describe conductive tissue of plants.

b) Describe with the help of neat diagram the structure of Chloroplast.

c) What are photosystem? Describe cyclic electron flow.

d) Comment an plant-plant signaling.

e) Explain the process of fruit development & ripening.

SECTION - II

Q5) Answer the following. **[11]**

a) Explain the importance of Rubisco.

b) Describe Nitrogen Cycle.

c) Elaborate on the function of auxin & Cytokinins in plant growth & development.

Q6) Short Note. **[12]**

a) Photorespiration and its adaptation

b) Gibberellin

c) Calvin cycle

Q7) Answer the following. **[12]**

a) What are alkaloids? Explain its importance.

b) Explain the working of Nitrogenase.

c) Comment on the application of Gum, pectins & Rubber.

Q8) Answer the following. (any 4) **[12]**

a) Explain the importance of phenolic, flavonoids class of metabolite.

b) Comment on assimilation of sulfate.

c) Explain the role of Abscisic acid in plant growth.

d) Comment an importance of phosphorus as micro-nutrient in plant growth.

e) Describe with examples seed storage proteins.

Total No. of Questions : 4]

SEAT No. : ____

P356

[Total No. of Pages : 2

[5831]-204
M.Sc.-I
BIOCHEMISTRY
CBOP-2 BCH-214 (A) : Microbiology
(2019 Pattern) (Semester - II)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory and carry 11 marks.***
2) ***Attempt any two questions from Q.2 to Q.4***
3) ***Figures to the Right indicate full marks.***

Q1) Answer the following questions. **[11]**

a) Explain morphologically classified types of bacteriophages. **[2]**

b) Explain principle and working of phase contrast microscopy. **[4]**

c) Explain chemical agents used to control the growth of microorganisms with it's applications. **[5]**

Q2) Write short note on following. **[12]**

a) Symbiotic nitrogen fixation.

b) Electron microscopy.

c) Lysogenic cycle of bacteriophage.

Q3) Attempt the following. **[12]**

a) Explain classification of bacteriophages based on its genetic material.

b) Explain the normal growth curve of E.coli.

c) Explain host-microbe interaction.

P.T.O.

Q4) Attempt any four of the following. **[12]**

a) Differentiate between prokaryotes and eukaryotes.

b) What is pure culture? How will you prepare a pure culture of bacteria from soil sample.

c) Give the protocol for positive and negative staining. of bacteria.

d) Explain the role of nitrogenase complex in nitrogen cycle.

e) What is continuous culture of bacteria? Why is it necessary?

Total No. of Questions : 8]

SEAT No. : ____

P357

[Total No. of Pages : 3

[5831]-301
M.Sc.-II
BIOCHEMISTRY
BCH-311 : Molecular Biology
(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer to the Two sections should be written in separate answer books.***
2) ***Questions 1 and 5 are compulsory out of remaning attempt any two questions. (Q.no 2 to 4) from section I and any two questions (Q.No. 6 to 8) from section II.***
3) ***Figures to the Right side indicate full marks.***
4) ***Neat diagrams must be drawn wherever necessary.***

SECTION-I

Q1) a) Attempt any FOUR of the following. **[4×2=8]**

i) Write the function of Topoisomerase enzyme.

ii) What is role of Exam.

iii) Define the term Translation.

iv) Write importants of Introns.

v) Define the term apoptosis.

b) Write short account on sos repair of DNA. **[3]**

Q2) Attempt the following. **[6]**

a) Differentiate between DNA polymerase I, II & III. with respect to their cetalytic activity and subunit structure.

b) i) What is splicing of RNA? Why there is need of splicing? **[4]**

ii) Write the function of enzyme lipase in replication. **[2]**

P.T.O.

Q3) Attempt the following. **[12]**

a) Explain in detail Excision Repair Mechanism **[4]**

b) How okazak fragments are formed? **[4]**

c) Write the functions of promoters, sigma factor Rho factor and wistones. **[4]**

Q4) Attempt the following. **[12]**

a) With examples explain inhibitors of transcription & mode of action. **[4]**

b) Write short note on post translational modification. **[4]**

c) Write short note on catalytic RNA. **[4]**

SECTION-II

Q5) a) Attempt any FOUR of the following. **[4×2=8]**

i) Define the term Ribosome?

ii) What is Translation?

iii) Write the names of RNA participating in Translation process?

iv) Why there is need of protein degradation.

v) Write name of any two mechanism by which baueria make defence?

b) With the help of diagram explain the mechanism of proteosomol degradation. **[3]**

Q6) Attempt the following.

a) Explain the mechanism of initiation of translation in E-codi. **[6]**

b) What is a nonsense cidon? **[4]**

c) In eukaryotes where transcription is localized. **[2]**

Q7) Attempt the following. **[12]**

a) Explain the role of elongation factor in Translation. **[4]**

b) Explain protein trafficking. **[4]**

c) What is myosin and actin. **[4]**

Q8) Attempt the following. **[12]**

a) What are epigeatic modification or changes. **[4]**

b) Elaborate role of ubiquitin in protein degradation. **[4]**

c) Explain role of amino acid tRNA synthetase in details. **[4]**

Total No. of Questions : 8]

SEAT No. : ____

P358

[Total No. of Pages : 2

[5831]-302
M.Sc.
BIOCHEMISTRY
BCH-312 : Immunology
(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer to the Two sections should be written in separate answer books.***
2) ***Q.1 and Q.5 are compulsory and carry 11 marks each.***
3) ***Attempt any two questions from Q.2 to Q.4 and two questions from Q.6 to Q.8.***
4) ***Figures to the Right side indicate full marks.***

SECTION-I

Q1) Answer the following questions. **[11]**

a) Explain variable gene rearrangement of Ig genes. **[3]**

b) Discuss the role of cells involved in cell mediated immunity. **[4]**

c) What are lymphoid organs? Give its type and list the names of lymphoid organs. **[4]**

Q2) Write a short note on. **[12]**

a) Monoclonal antibody production.

b) Complement system.

c) Humoral immune response.

Q3) Answer the following questions. **[12]**

a) Discuss class I and class II MHC molecule with their function.

b) Explain the structure and types of Toll-like receptors (TLR'S)

c) Describe regulations of Ig gene.

P.T.O.

Q4) Answer the following questions (Any four) **[12]**

a) Write a note on blood group substances.

b) What are super antigens? Give examples.

c) Define allotypes and give examples.

d) What are adjuvants? give its types.

e) What are constant & variable regions of antibody?

SECTION-II

Q5) Answer the following questions. **[11]**

a) Discuss the presentation of non-peptide antigens. **[3]**

b) Explain type-II hypersensitivity reaction with suitable example. **[4]**

c) Discuss primary T cell immunodeficienay diseases. **[4]**

Q6) Write a short note. **[12]**

a) Western blotting.

b) CAR-T cell therapy.

b) Types of graft rejection.

Q7) Answer the following questions. **[12]**

a) What are immuno deficiency diseases? Discuss the features of one such disease.

b) What are vaccines? Explain different types of vaccines with examples.

c) Explain principle, types and applications of ELISA.

Q8) Answer the following questions (Any four) **[12]**

a) Differentiate between active and passive immunity.

b) What are interferons? give its significance.

c) Explain delayed type of hypersensitivity reactions.

d) Explain FISH technique.

e) Define tumor antigen, Give examples.

Total No. of Questions : 8]

SEAT No. : ____

P359

[Total No. of Pages : 2

[5831]-303
M.Sc.
BIOCHEMISTRY
BCH-313 : Recombinant DNA Technology
(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer to the Two sections should be written in separate answer books.***
2) ***Q.1 and Q.5 are compulsory and carry 11 marks each.***
3) ***Attempt any two questions from Q.2 to Q.4 and two questions from Q.6 to Q.8.***
4) ***Figures to the Right side indicate full marks.***

SECTION-I

Q1) Answer the following questions. **[11]**

a) Differentiate between transformation and transfection process. **[2]**

b) What are vectors? Give the importance of PUC 18 in recombinant DNA technology. **[4]**

c) Why are restriction endonucleases called so? Give two examples of restriction endonucleases with its recognition sequence. **[5]**

Q2) Write a short note on following. **[12]**

a) Blue-White Screeing. **[4]**

b) DNA libraries. **[4]**

c) Ti plasmid. **[4]**

Q3) Attempt the following. **[12]**

a) Give the protocol to isolate DNA from bacterial cells with role of each chemical used. **[4]**

b) Explain the concept of gene cloning and it's importance. **[4]**

c) Differentiate among the yeast Cloning Vectors. **[4]**

P.T.O.

Q4) Attempt any four of the following. **[12]**

a) What are the methods to put sticky ends to blunt ended DNA molecules. **[3]**

b) Explain different types of polymerases used in Recombinant DNA technology. **[3]**

c) Explain chip-seq assay. **[3]**

d) Explain the production of recombinant insulin. **[3]**

e) How is gene expression study done in E.coli? **[3]**

SECTION-II

Q5) Answer the following questions. **[11]**

a) Give the importance of Human Genome Project. **[2]**

b) Explain RT-PCR and its applications. **[4]**

c) Explain gene transfer strategies in order to produce transgenic animals. **[5]**

Q6) Write a short note on following. **[12]**

a) Report gene. **[4]**

b) Northern blotting. **[4]**

b) RNA interference. **[4]**

Q7) Attempt any four of the following. **[12]**

a) Describe chain termination method to sequence DNA. **[3]**

b) Write a note on CRI SPR/Cas g. **[3]**

c) Explain the need of studing transcriptome. **[3]**

d) Explain the role of SYBR green to analyze gene expression. **[3]**

e) Explain the importance of protein engineering. **[3]**

Q8) Answer the following. **[12]**

a) Enlist the types and application of PCR. **[4]**

b) Explain genome annotations. **[4]**

c) What are social. ethical & legal issues regarding human genome project? **[4]**

Total No. of Questions : 8]

SEAT No. :

P360

[Total No. of Pages : 2

[5831]-304
M.Sc.
BIOCHEMISTRY
BCH-314 (A) : Bioprocessing and Industrial Biochemistry
(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer to the two sections should be written in separate answer books.***
2) ***Q.1 and Q.5 are compulsory.***
3) ***Attempt any two questions from Q.2 to Q.4 and any two questions from Q.6 to Q.8.***
4) ***Figures to the right side indicate full marks.***

SECTION-I

Q1) Answer the following questions. **[11]**

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

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

c) Explain the different types of chromatography techniques used for product recovery. **[5]**

Q2) Write a short note on following. **[12]**

a) Media optimization **[4]**

b) Methods of preservation of Industrial micro-organisms. **[4]**

c) Batch culture. **[4]**

Q3) Answer the following questions. **[12]**

a) What is the effect of O_2 supply on product in fermentation process? **[4]**

b) Give the method for development of innoculum for yeast process. **[4]**

c) Explain design of fermenter. **[4]**

P.T.O.

Q4) Attempt the following questions. (any four) **[12]**

a) What are different biological methods of effluent treatment? **[3]**

b) Give applications of fermentation industry. **[3]**

c) What are different carbon sources used in fermentation media? **[3]**

d) Give the steps involved in citric acid production by fermentation. **[3]**

e) What are different types of agitators? **[3]**

SECTION-II

Q5) Answer following questions. **[11]**

a) Discuss various physical & chemicals agent used for sterilization. **[4]**

b) Give advantages and dis-advantages of natural and synthetic media. **[4]**

c) What are cell repositories? Explain preservation of cell lines. **[3]**

Q6) Write a short note on following. **[12]**

a) Somatic cell Hybridisation. **[4]**

b) Organ culture methods. **[4]**

c) Contact inhibition and its effect on cell line. **[4]**

Q7) Answer the following quesions. **[12]**

a) What are secondary metabolites? Give the technique for enhancing their production. **[4]**

b) Explain steps involved in plant weaving and hardening. **[4]**

c) What are heterokaryone and varient cell? Give example. **[4]**

Q8) Attempt the following questions (any four). **[12]**

a) What is media? Give the importance of micronutrient. **[3]**

b) Give the characteristics of established cell line. **[3]**

c) What is hairy root culture? **[3]**

d) Define cell banking. Give importance. **[3]**

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

Total No. of Questions : 8]

SEAT No. :

P361

[Total No. of Pages : 2

[5831]-401
M.Sc.
BIOCHEMISTRY
BCH-411 : Neurochemistry and Endocrinology
(2019 Pattern) (Semester - IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answers to the Two sections should be written in separate answer books.***
2) ***Q.1 and Q.5 are compulsory.***
3) ***Attempt any two questions from Q.2 to Q.4 and two questions from Q.6 to Q.8.***
4) ***Figures to the right side indicate full marks.***

SECTION-I

(Neurochemistry)

Q1) Answer the following questions. **[11]**

a) What are neuropeptides? Give their roles with examples. **[3]**

b) Describe sensory areas and association areas of the brain. **[4]**

c) What are neuron? Give their types based on cellular projections. **[4]**

Q2) Write a short note on following. **[12]**

a) Sensory receptors

b) Cerebrospinal fluid

c) Long- term memory.

Q3) Answer the following questions. **[12]**

a) Define action potential? What are the steps involved in generation of action potential. **[4]**

b) What are the components of diencephalon? Describe the functions of diencephalon. **[4]**

c) Explain the synthesis, action, storage and degradation of acetylcholine. **[4]**

P.T.O.

Q4) Attempt the following questions. (any four) **[12]**

a) Distinguish between gray matter and white matter. **[3]**

b) What is blood brain barriers give it's importance. **[3]**

c) Describe role of CAM kinase II, cAMP and calpain in memory of learning process. **[3]**

d) What are afferent and efferent Pathway. **[3]**

e) What are glutamate receptors? Give it's different types. **[3]**

SECTION-II

Q5) Answer the following questions. **[11]**

a) What are catecholamines? Explain their physiological function. **[3]**

b) Describe the biosynthesis and regulation of T_3 and T_4 hormones. **[4]**

c) Explain the physiological function and regulation of cortisol **[4]**

Q6) Write a short note on following. **[12]**

a) Write a short note on "Hormonal interrelationship". **[4]**

b) Role of Insulin in regulation of blood sugar level. **[4]**

c) cAMP as a secondary messenger. **[4]**

Q7) Answer the following questions. **[12]**

a) Describe the synthesis of hormones in pituitary gland. **[4]**

b) What are the general effects of somatotropin hormone. **[4]**

c) Discuss the pathophysiology of FSH and LH. **[4]**

Q8) Answer the following questions (any four). **[12]**

a) Discuss the role of Epidermal Growth factor. **[3]**

b) Explain the role of tyrosine kinase in Insulin mechanism. **[3]**

c) What is glucagon? Where is it synthesized and what are its target cells. **[3]**

d) What are releasing hormones and where are their target receptors. **[3]**

e) Describe the target cell insensitivity with one example. **[3]**

Total No. of Questions : 8]

SEAT No. :

P362

[Total No. of Pages : 2

[5831]-402
M.Sc. - II
BIOCHEMISTRY
Bch-412 : Medical and Physiological Biochemistry
(2019 Pattern) (Semester - IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer to the Two sections should be written in separate answer papers.***
2) ***Question number 1 and 5 are compulsory out of maining attempt any two questions (Q.No. 2 to 4) from sections I and any two questions (Q.No. 6 to 8) from section II.***
3) ***Figures to the Right side indicate marks.***
4) ***Neat labelled diagram is required.***

SECTION-I
(Medical Biochemistry)

Q1) a) Attempt any Four of the following. **[4×2=8]**

i) Write any two functions of lysosomes

ii) What is proto-oncogene?

iii) What is Oncogene?

iv) What do you mean by term hallucinogens?

v) Define the term hemoglobinopathies.

b) Describe the mode of action of analgesics. **[3]**

Q2) Attempt the following.

a) Describe the various modes of resistance of antibiotics. **[6]**

b) Write the name so of lysosomal storage diseases. **[2]**

c) List the causative agents of cancer. **[2]**

d) List the names of enzymes used to diagnose CHO. **[2]**

Q3) Attempt the following. **[12]**

a) How tetracycline inhibit the growth of bacteria. **[4]**

b) Write about the mechanism of action of lysosome. **[4]**

c) Write biochemistry and mutation found in sickle cell anemia. **[4]**

P.T.O.

Q4) Attempt the following. **[12]**

a) Write the mechanism of action of antibiotics that halted translation process. **[4]**

b) How plages and fungles are formed in Alzimer disease. **[4]**

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

SECTION-II

(Physiological Biochemistry)

Q5) a) Attempt any four of the following. **[4×2=8]**

i) Write the functions of minerals calcium and sodium.

ii) Name the first step in blood clotting.

iii) List the enzyme names used in diagnosis of liver functions test.

iv) What is location of kindney in the body.

v) Write functions of liver.

b) Write a neat labelled diagram of hepatocyle. and explain it. **[3]**

Q6) Attempt the following. **[12]**

a) Draw a neat labelled diagram of functional unit of kidney with explanation. **[6]**

b) how carbohydrates are digested? **[4]**

c) Define the term Bohrs effect. **[2]**

Q7) Attempt the following. **[12]**

a) How proteins are digested. **[4]**

b) Define the term Jaundice and explain various types of Jaundice. **[4]**

c) Write about fibrinolysis. **[4]**

Q8) Attempt the following. **[12]**

a) List the clotting factors neatly **[4]**

b) Write short note on Respiratory acidosis. **[4]**

c) How carbon dioxide and oxygen are transported in the body. **[4]**

Total No. of Questions : 8]

SEAT No. : ____

P363

[Total No. of Pages : 2

[5831]-403
M.Sc.
BIOCHEMISTRY
BCH-413 (B) : Clinical Nutrition and Food Technology
(2019 Pattern) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer to the Two sections should be written in seperate answer books.***
2) ***Q.1 and Q.5 are compulsory.***
3) ***Attempt any two questions from Q.2 to Q.4 and any two questions from Q.6 to Q.8.***
4) ***Figures to the Right side indicate full marks.***

SECTION-I

(Clinical Nutrition)

Q1) Answer the following questions. **[11]**

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

b) What is food allergy? give its causes. **[4]**

c) Describe factors affecting digestion and absorption of food. **[5]**

Q2) Write a short note on following. **[12]**

a) Diet and nutrition in India. **[4]**

b) Malnutrition and it's effects. **[4]**

c) Food habit's and food fodism. **[4]**

Q3) Answer the following questions. **[12]**

a) Describe the effect of irradiation, cooking, refining and fermentation on nutritional quality of food. **[4]**

b) What is kwashiorkor syndrome? Give its symptom and causes. **[4]**

c) What are different methods used for assesment of nutritional status. **[4]**

P.T.O.

Q4) Attempt the following questions (Any four) **[12]**

a) What are differences between natural and genetically modified foods. **[3]**

b) What are the causes of obesity. **[3]**

c) How food & nutritional security is brought by different methods. **[3]**

d) Explain causes, symptoms and treatment of phenylketonuria. **[3]**

e) What are ill effects of obesity. **[3]**

SECTION-II

Q5) Answer the following questions. **[11]**

a) What are good manufacturing practices. **[3]**

b) What are natural and artificial food colorants. **[4]**

c) What are different methods of food preservation. **[4]**

Q6) Write a short note on following. **[12]**

a) Single cell protein production. **[4]**

b) Starch production from potato. **[4]**

b) Enzymes used in meat tenderisation. **[4]**

Q7) Answer the following questions. **[12]**

a) What are genetically modified foods? How they are manufactured. **[4]**

b) Explain the principle of HACCP system. **[4]**

c) What are the different types of bacterial and fungal food spoilages of plant originated food. **[4]**

Q8) Answer the following questions (Any four) **[12]**

a) Name the enzymes used in food analysis of alcohol with their role.

b) Give the roles of BIS, FPO and codex.

c) What are nutritional and non-nutritional sweetners.

d) Explain mechanism of sorbic acid and sorbates in controlling the microbial spoilage.

e) Explain any 3 taste flavorants.