

Total No. of Questions : 8]

SEAT No. :

PC-3795

[Total No. of Pages :2

[6337]-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.*
- 2) *Attempt any two questions from Q.2 to Q.4. for section I and from Q.6 to Q.8 for section II.*
- 3) *Answer to the both sections should be written on separate answer sheets.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

(Carbohydrates and Lipids)

Q1) Attempt the following : [11]

- a) What are deficiency Syndromes and dietary Sources of Vit. A? [2]
- b) Write two examples each of aldose and ketose sugar. [2]
- c) Differentiate between saturated and unsaturated fatty acids with example. [2]
- d) What is the chemical composition of living matter? [2]
- e) Define Osmosis. What do you understand by the terms hypertonic solution and hypotonic solution? [3]

Q2) Attempt the following : [12]

- a) Write the classification of lipids with one example of each. [6]
- b) Define polysaccharides. Differentiate between starch, glycogen and cellulose. [6]

P.T.O.

- Q3) Attempt the following :** [12]
- a) Draw the structures of phosphatidic acid, cephalin and phosphatidylinositol. [3]
 - b) Write biochemical functions of riboflavin and biotin. [3]
 - c) Explain reducing properties and OSQ zone formation of monosaccharides. [3]
 - d) Differentiate between prokaryotic and eukaryotic cells. [3]

- Q4) Write a short note on following :** [12]
- a) Fat soluble vitamins.
 - b) Ionization of water.
 - c) Sugar derivatives.

SECTION - II
(Proteins)

- Q5) Attempt the following :** [11]
- a) Define supersecondary structure and give one example. [2]
 - b) What is meant by signature sequences? [2]
 - c) Write the reaction of protein with Sanger's reagent. [2]
 - d) Write the importance of primary structures of proteins. [2]
 - e) Draw the structure of arginine, histidine and lysine highlighting differences between them. [3]

- Q6) Attempt the following :** [12]
- a) Explain chemical synthesis of a peptide. [6]
 - b) Explain different organization of proteins based on motifs. [6]

- Q7) Attempt the following :** [12]
- a) Explain folding of proteins assisted by molecular chaperons. [4]
 - b) Explain titration curve of histidine along with graphical representation. [4]
 - c) Classify the proteins based on their chemical nature. [4]

- Q8) Write a short note on following.** [12]
- a) Ramchandran plot.
 - b) Collagen.
 - c) Classification of amino acids.



Total No. of Questions : 8]

SEAT No. :

PC3796

[Total No. of Pages : 2

[6337]-102

First Year M.Sc.

BIOCHEMISTRY

**BCH- 112 : Physical Biochemistry
(2019 Pattern) (Semester - I)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answers 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 question from Q.6 to Q.8.*
- 4) Figures to the right indicate full marks.*

SECTION - A

- Q1)** Answer the following. [11]
- a) Define the term 'ion exchangers's. What are it's types. [3]
 - b) Explain in detail the properties, advantages and disadvantages of fibre glass filters. [4]
 - c) What is electrophoresis? Differentiate between gel electrophoresis and paper electrophoresis. [4]
- Q2)** Write a short note on the following. [12]
- a) Gradient electrophoresis. [4]
 - b) Reverse dialysis. [4]
 - c) Applications of sedimentation. [4]
- Q3)** Answer the following questions. [12]
- a) What is Thin Layer chromatography? Explain it's principle in detail. [4]
 - b) How 'DNA' can be purified using an electrophoresis technique. [4]
 - c) Explain the application of gas chromatography. [4]
- Q4)** Answer the following question. [12]
- a) What is viscometer? Define the term Relative viscosity, specific viscosity & intrinsic viscosity. [4]
 - b) Name and give properties of differen types of 'gels' used in electrophoresis. [4]
 - c) Diffentiate between preparative and analytical centrifuge. [4]

P.T.O.

SECTION - B

Q5) Answer the following questions. [11]

- a) What is Lambert Beer's Law & what do you mean by positive and negative deviations. [3]
- b) Name the different types of light sources and photodetectors used in spectrophotometer. [4]
- c) Give the applications of mass spectroscopy. [4]

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

- a) Spectrofluorometer. [4]
- b) Time of flight - mass detector. [4]
- c) Polarised light & its type. [4]

Q7) Answer the following questions. [12]

- a) Explain the principle of IR spectroscopy. [4]
- b) Give the instrumentation of mass spectrometer. [4]
- c) What are applications of atomic absorption spectroscopy. [4]

Q8) Answer the following questions. [12]

- a) Define the term absorption maxima? Give the factors which affect ' λ_{max} '. [4]
- b) What are different ionisation methods used in mass spectrometry. [4]
- c) Differentiate between ORD & CD. [4]

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

PC3797

[6337]-103

First Year M.Sc.

BIOCHEMISTRY

BCH-113 : Cell Biology and Membrane Biochemistry

(2019 Pattern) (Semester-I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Question 1 and Q.5 are compulsory and carry 11 marks.*
- 2) Attempt any two questions from Q.2 to Q.4.*
- 3) Attempt any two questions from Q.6 to Q.8.*
- 4) Answer of both sections should be written in separate answer sheets.*
- 5) Figures to the right indicate full marks.*
- 6) Well labelled diagrams should be drawn wherever necessary.*

SECTION-I

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

- a) What is the main purpose of lysosomes in a cell? **[2]**
- b) Describe the three main components of the cytoskeleton and their respective roles. **[4]**
- c) Differentiate between eukaryote and prokaryote **[5]**

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

- a) Plant cell
- b) Fibronectin
- c) Meosis

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

- a) How is sub-cellular fractionation used to isolate and study organelles such as mitochondria, lysosomes or nuclei?
- b) Explain with the diagram the process of mitosis.
- c) Discuss the different types of cell junctions found in multicellular organisms and their specific roles.

P.T.O.

Q4) Answer the following questions (any four) [12]

- a) Comment on the biological importance of fungi.
- b) Explain with the help of a neat labelled diagram the ultra structure of cell.
- c) Discuss the key stages and processes involved in organogenesis during embryonic development.
- d) Explain the role of cyclins and cyclin-dependent kinases in controlling the cell cycle.
- e) What is a crosome reaction?

SECTION-II

Q5) Answer the following questions. [11]

- a) What is flip-flop in the context of membrane lipid movement? [2]
- b) What are the components of biological membrane? [4]
- c) Transport of protein toxins across cell membranes. [5]

Q6) Write a short note. [12]

- a) Receptor mediated endocytosis
- b) Na/K AT pase
- c) Cystic fibrosis

Q7) Answer the following questions. [12]

- a) Explain different types of transport across the membrane.
- b) Explain the mechanism of action of ion translocating antibiotics such as valinomycin and gramicidin.
- c) What is membrane fluidity and how is it regulated?

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

- a) What are flipase? Give their importance.
- b) Explain membrane asymmetry?
- c) Explain the mechanism of activation of voltage-gated ion channels.
- d) Describe ATP-ADP exchanger.
- e) Explain ABC transporters and their mechanism of functioning.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

PC3798

[6337]-104

M.Sc. (Part - I)

BIOCHEMISTRY

BCH 114 : Enzymology

(2019 Pattern) (Semester - I)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) Q1 is compulsory and carries 11 marks.*
- 2) Attempt any two questions from Q2 to Q4.*
- 3) Figures to the right indicate full marks.*

Q1) Answer the following questions :

[11]

- a) Give Michael's - Menten equation and define each term. **[3]**
- b) Explain difference in substrate specificity between chymotrypsin, trypsin and elastase. **[4]**
- c) Explain why ser-195 of chymotrypsin is super reactive. **[4]**

Q2) Write short note :

- a) Acid-base catalysis. **[12]**
- b) Measurement methods for k_s and k_d .
- c) Site directed mutagenesis.

P.T.O.

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

- a) Discuss the mechanism of bi - substrate reaction for enzyme catalysis.
- b) How pre-steady state kinetics is studied? Give its significance.
- c) Describe affinity labelling with suitable example.

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

- a) Describe the ubiquitin cycle for enzyme degradation.
- b) Discuss in detail about types of enzymes based on its specificity.
- c) Discuss the features of KNF and MWC models.
- d) Explain double displacement mechanism along with suitable example.
- e) Explain ternary complex formation reaction mechanism.

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Total No. of Questions : 8]

SEAT No. :

PC3799

[6337]-201

[Total No. of Pages :2

First Year M.Sc.

BIOCHEMISTRY

**BCH-211 : Metabolism (Reactions of Biomolecules)
(2019 Pattern) (Semester- II)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q. No. 1 and Q. No. 5 are compulsory.*
- 2) *Attempt any two questions from Q.2 to Q.4.*
- 3) *Attempt any two questions from Q.6 to Q.8.*
- 4) *Use separate answer sheets for sections.*
- 5) *Figure to the right side indicate Marks.*
- 6) *Draw diagrams wherever necessary.*

SECTION - I

(Carbohydrate and Lipid Metabolism)

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

- i) Define the term standard free Energy.
 - ii) What is the significance of ATP?
 - iii) Write important of Glyoxylate cycle.
 - iv) List various types of fatty acid oxidation.
 - v) How ketone bodies are formed in the body?
- b) How TCA cycle is regulated? **[3]**

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

- a) Draw a labelled diagram of ETC and ATP synthase complex and describe oxidative phosphorylation. **[6]**
- b) Explain fatty acid synthase complex. **[4]**
- c) Write the Energetic Equation of Glycolysis. **[2]**

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

- a) Explain the reactions involved in complete oxidation of palmitoyl CoA write Energetic reaction showing ATP generated during oxidation. **[6]**
- b) Discuss role of 'glycogenin' in the synthesis of Glycogen. **[4]**
- c) Write the significance of Glucuronic acid pathway. **[2]**

Q4) Answer the following questions. **[12]**

- a) Explain carnithine shuttle. **[4]**
- b) Discuss the control points of Gluconeogenesis. **[4]**
- c) How glycogen liberate glucose to make entry in Glycolysis? Explain. **[4]**

P.T.O.

SECTION - II
(Amino Acid and Nucleotide Metabolism)

- Q5)** a) Attempt the following questions. (any four) **[4×2=8]**
- i) Define the term de-nova pathway.
 - ii) Define the term proteolysis with example.
 - iii) Write the conversion of
Ribose 5-phosphate → phosphoribosyl - pyrophosphate (PRPP).
 - iv) List the amino acid entry in oxaloacetate pathway.
 - v) Define Transamination with example.
- b) Explain conversion of Ribonucleotide into deoxyribonucleotide. **[3]**
- Q6)** Attempt the following questions. **[12]**
- a) Explain urea cycle with diagram and all reactions involved in it. **[6]**
 - b) Elaborate role of tetrahydrofolate in conversion of serine to glycine.
(ser → Gy). **[4]**
 - c) Write the following conversion. **[2]**
UTP → CTP
- Q7)** Answer the following questions. **[12]**
- a) Draw a flow chart and describe the degradation of pyrimidine nucleotide. **[4]**
 - b) What is gout? **[2]**
 - c) Write the conversion. Imp → Gmp. **[2]**
 - d) What is phenylketouria? Explain its causes and symptoms. Write reaction of Enzyme. **[4]**
- Q8)** Answer the following questions. **[12]**
- a) 'Regulation of purine biosynthesis'. Write short note on this. **[4]**
 - b) With the help of diagram give the function of 'precursor' in amino acid synthesis. **[4]**
 - c) Explain 'Maple syrup urine' disease. **[4]**



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

PC3800

[6337]-202

First Year M.Sc.

BIO - CHEMISTRY

BCH - 212 : Genetics (Chemistry of Nucleic Acids)

(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q. 1. & Q. 5. are compulsory and carry 11 marks.*
- 2) Attempt any two questions from Q.2. to Q.4. for section I and from Q.6. to Q.8. for Section II.*
- 3) Answer to the both sections should be written on separate answer sheets.*
- 4) Figures to the right indicate full marks.*

SECTION - I

(Principles of Heredity and Variations)

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

- a) Define co-dominance with example. **[2]**
- b) Explain renaturation of DNA. **[2]**
- c) Give any 4 characters of pea plant. **[2]**
- d) Explain sex limited characters. **[2]**
- e) Explain in detail Mendel's law of segregation. **[3]**

Q2) Write short notes on :- **[12]**

- a) Lac Operon
- b) Linkage
- c) Pseudoalleles

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

- a) Describe the structure of mRNA, t-RNA and rRNA with their functions.
- b) What is recombination? Explain with examples gene mapping by recombination.
- c) Explain Avery MacLeod - McCarty experiment to prove DNA as genetic material .

P.T.O.

Q4) Answer the following :- [12]

- a) Explain Epistasis and its types with suitable examples.
- b) Explain crossing over of genes.
- c) Define plasmid and explain different types of plasmids in bacterial cell.

SECTION - II

(Population Genetics)

Q5) Answer the following :- [11]

- a) What are conditional mutants? [2]
- b) What are prototrophs? Give examples. [2]
- c) How are mutants isolated? [2]
- d) Describe any 2 physical mutagen. [2]
- e) Explain the process of conjugation in bacteria. [3]

Q6) Write short notes on :- [12]

- a) Hardy - Weinberg equilibrium.
- b) Genetic fitness
- c) Klinefilter syndrome.

Q7) Answer the following :- [12]

- a) Explain the signs and symbols used in pedigree analysis.
- b) Explain Euploidy with suitable examples.
- c) Describe in detail different elements of population genetics.

Q8) Answer the following :- [12]

- a) Explain rating system.
- b) Describe tools and techniques used for diagnosis of human genetic disorders.
- c) Explain genetic approach to complex genetic diseases like hypertension and diabetes.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

PC3801

[6337]-203

First Year.M.Sc.

BIOCHEMISTRY

**BCH - 213 : Plant Biochemistry
(2019 Pattern) (Semester - II)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer to the two sections should be written in a seperate answer book.*
- 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 questions. [11]

- a) What is oxygen evolving complex? [3]
- b) Explain the mechanism of adaptation to wards abiotic stress. [4]
- c) Discuss SAR Mechanism (Systemic Acquired Resistance) in plants [4]

Q2) Write short notes on the following. [12]

- a) Pests in plant [4]
- b) Seed dormancy [4]
- c) Electron flow during light reaction. [4]

Q3) Attempt the following. [12]

- a) List any three functions of plant vacuole [4]
- b) Explain the molecular biology of source sink relationship in plants. [4]
- c) Comment on pharmaceutical and neutraceutical values of plants. [4]

P.T.O.

- Q4)** Answer the following questions. [12]
- a) Describe the biochemical process of seed germination [4]
 - b) Comment on plant-plant signalling. [4]
 - c) Describe plant mutualism interaction in detail with example. [4]

SECTION - II

- Q5)** Answer the following. [11]
- a) Give a short account on flavonoids. [3]
 - b) Comment on assimilation of sulfate [4]
 - c) Explain the working of Nitrogenase. [4]

- Q6)** Write short notes on the following. [12]
- a) Calvin cycle [4]
 - b) Sulphur cycle [4]
 - c) Terpenoids [4]

- Q7)** Attempt the following questions. [12]
- a) Elaborate the function of auxin and cytokinin in plant growth and development. [4]
 - b) Describe with example seed storage proteins. [4]
 - c) Discuss micronutrients required for over all development of plant. Write role of any two in detail. [4]

- Q8)** Answer the following questions. [12]
- a) What are alkaloids and how are they important? [4]
 - b) Explain assimilation of Nitrogen in Nitrogen fixation. [4]
 - c) Give role of secondary metabolites in plants. [4]



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

PC3802

[6337]-204

M.Sc. - I

BIOCHEMISTRY

CBOP 2 BCH - 214 : MICROBIOLOGY

(2019 Pattern) (Semester - II) (Elective Option - A)

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) Attempt the following. [11]

- a) Define autotrophs and heterotrophs with example. [2]
- b) Write the composition of 100 ml nutrient agar media describing role of each ingredient in it. [4]
- c) Explain the physical agents used to control growth of microorganisms.[5]

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

- a) Symbiotic nitrogen fixation.
- b) Phase contrast microscopy.
- c) Normal growth curve of E.coli.

Q3) Answer the following. [12]

- a) What is the role of capsular material of pathogen while causing infection to the host cell?
- b) What are culture conditions of psychrophiles, mesophiles and thermophiles?
- c) What is the role of nitrate reductase?

P.T.O.

Q4) Answer any four of the following.

[12]

- a) Differentiate between batch culture and continuous culture.
- b) Explain the classification of plant viruses.
- c) Explain resistance and immunity.
- d) Write the types and role of flagella and plasmid.
- e) Differentiate between endotoxin and exotoxin.



Total No. of Questions : 8]

SEAT No. :

PC-3803

[Total No. of Pages : 2

[6337]-301

M.Sc. (Biochemistry)

BCH-311 : MOLECULAR BIOLOGY

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 and Q.5 are compulsory.*
- 2) *Attempt any two questions from Q.2 to Q.4 for section I and from Q.6 to Q.8 for section II.*
- 3) *Answer to the both section should be written on separate answer sheets.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Q1) Answer the following: [11]

- a) Define the term Replication. And draw the replication fork. [2]
- b) What is the function of enzyme helicase? [2]
- c) What are Okazaki fragments? [2]
- d) Explain the central dogma of molecular biology. [2]
- e) Explain the fidelity of DNA. [3]

Q2) Answer the following. [12]

- a) Differentiate between DNA polymerase I, II and III. [4]
- b) Explain the mechanism of Base Exision Repair. [4]
- c) What is spliceosome? Explain in detail. [4]

Q3) Write short notes on : [12]

- a) Apoptosis. [4]
- b) Mobile genetic element. [4]
- c) Processing of RNA. [4]

P.T.O.

- Q4) Answer the following :** [12]
- a) Describe in detail the process of transcription in prokaryotes. [4]
 - b) Describe in detail Homologous genetic recombination. [4]
 - c) Write a note on DNA damage. [4]

SECTION - II

- Q5) Answer the following.** [11]
- a) What is the role of mRNA in translation? [2]
 - b) Define protein glycosylation. [2]
 - c) What is the role of ribosomes in translation? [2]
 - d) What are stop codons? Enlist stop codons. [2]
 - e) Explain the role of EF - Tu in E. coli during translation. [3]

- Q6) Write short notes on :** [12]
- a) Ubiquitination. [4]
 - b) Genome protection. [4]
 - c) Protein Trafficking. [4]

- Q7) Answer the following :** [12]
- a) Describe the structure of Ribosomes in prokaryotes and give the role of tRNA. [4]
 - b) Explain the mechanism of Bacterial defence against viruses. [4]
 - c) Describe the inhibitors of translation in Prokaryotes. [4]

- Q8) Answer the following:** [12]
- a) Elongation of Translation in Prokaryotes. Explain in detail. [4]
 - b) Describe in detail protein targeting across ER membrane. [4]
 - c) What are epigenetic modifications? [4]



Total No. of Questions : 8]

SEAT No. :

PC3804

[6337]-302

[Total No. of Pages : 2

S.Y.M.Sc.

BIO-CHEMISTRY

BCH- 312 : Immunology

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 and Q.5 are compulsory.*
- 2) Use separate answer sheets for two sections.*
- 3) Attempt any two questions from Q.2 to Q.4.*
- 4) Attempt any two questions from Q.6 to Q.8.*
- 5) Figures to the right indicate full marks.*

SECTION - I

Q1) a) Answer any four of the following.

[4×2=8]

- i) Define the term epitope.
- ii) What are Immunoglobulins?
- iii) What is the main function of Innate immunity cells?
- iv) What are TLR. (Toll like Receptors)?
- v) Define the term Interferon.

b) Describe the function of Thymus using diagram.

[3]

Q2) Answer the following questions.

[12]

- a) With the help of diagram explain class I MHC molecule structure.
- b) What do you mean by secondary immune response? Explain.
- c) What are Peyer patches? Explain using diagram.

Q3) Answer the following questions.

[12]

- a) Write short note on phagocytic cells with diagram.
- b) Write about adjuvant? Explain Types.
- c) Explain classical pathway of complement system.

P.T.O.

Q4) Answer the following questions. [12]

- a) What are constant and variable regions of antibody?
- b) Explain structure of Natural killer cells.
- c) Differentiate between innate and adaptive immunity with example.

SECTION - II

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

- i) Describe the term Auto-Immune disorder.
- ii) What are Tumor-Antigen? Give example.
- iii) Write any two advantages of FISH Technique.
- iv) List the types of graft rejection.
- v) Define the term Immuno-deficiency.

b) Explain type II Hypersensitivity reactions. [3]

Q6) Answer the following questions. [12]

- a) Describe the principle and advantages, application of Immuno electrophoresis.
- b) Write short note on presentation of Non-peptide antigen.
- c) What are vaccines? Explain different types of vaccines with examples.

Q7) Attempt the following questions. [12]

- a) What is ELISA? Discuss types of ELISA with diagrams.
- b) Draw the structure of HIV.
- c) Explain antigen presenting and processing by Endocytic pathway.

Q8) Answer the following questions. [12]

- a) Describe passively Acquired immunity.
- b) Describe the limitation and disadvantage of RIA technique (Radio-Immuno-assay).
- c) Write short account on Western-Blotting.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

PC3805

[6337]-303

M.Sc. - II

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) Question 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 questions. [11]

- a) What is the role of calcium chloride in transformation process. [3]
- b) Discuss different types of E.coli vectors. [4]
- c) Give importance of PUC 18 in recombinant DNA technology. [4]

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

- a) DNA libraries [4]
- b) Blue-white screening [4]
- c) Vectors in plants [4]

Q3) Attempt the following. [12]

- a) Explain M13 bacteriophage as a vector and its significance. [4]
- b) Give the protocol to isolate DNA from bacterial cells with role of each chemical used. [4]
- c) Explain advantage of sticky ended DNA molecules over blunt ended.[4]

P.T.O.

Q4) Attempt any three of the following. [12]

- a) Describe yeast cloning vectors. [4]
- b) Write a note on role of phosphatases and taq polymerases in genetic engineering. [4]
- c) Explain the role of Ti plasmid in production of transgenic plant. [4]
- d) Explain the concept of gene cloning and its importance. [4]

SECTION-II

Q5) Answer the following questions. [11]

- a) Write a note on Human Genome Project. [3]
- b) What is transcriptome and proteome. [4]
- c) Explain blotting technique. [4]

Q6) Write short note on the following. [12]

- a) In vitro mutagenesis [4]
- b) RNA interference [4]
- c) Genome mapping [4]

Q7) Answer the following questions. [12]

- a) Explain the role of TaqMan in analysing genetic material. [4]
- b) Explain steps and application of PCR. [4]
- c) Discuss reporter gene. [4]

Q8) Answer the following questions. [12]

- a) Explain transgenic animal production with example. [4]
- b) Write a note on Reporter Gene. [4]
- c) Discuss Genome editing. [4]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 3

PC3806

[6337]-304

M.Sc. (Part - II)

BIOCHEMISTRY

**BCH-314(B) : Pharmacology and Forensic Biochemistry
(2019 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 and Q.5 are compulsory.*
- 2) *Use separate answer sheets for both sections.*
- 3) *Attempt any two questions from Q.2 to Q.4.*
- 4) *Attempt any two questions from Q.6 to Q.8.*
- 5) *Figures on right hand side indicate full marks.*

SECTION - I

(Pharmacology)

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

- i) Define the term anti-metabolites.
 - ii) Enlist various routes of drug Administration.
 - iii) What is Pharmacokinetic?
 - iv) What is ADR? (Adverse Drug Reactions)
 - v) What are the various sites of drug action.
- b) What are antagonists? What are the types of this drug. **[3]**

Q2) Write the answers of the following : **[12]**

- a) Describe hill coefficient.
- b) Explain apparent volume distribution.
- c) Explain Half life and clearance of drug.

P.T.O.

Q3) Answer the following questions. [12]

- a) Write short note on Drug-receptor interaction.
- b) List the challenges of Drug development.
- c) How drugs are classified?

Q4) Answer the following questions. [12]

- a) Write the mechanism of any one drug action.
- b) Explain passive diffusion using diagram.
- c) Explain application and use of genomes for discovery of drug.

SECTION - II

(Forensic Biochemistry)

Q5) a) Attempt any four questions : [4×2=8]

- i) List different areas of toxicology.
- ii) List Industrial application of toxicology
- iii) Give the names of toxic insecticides.
- iv) Define the term chronic toxicity.
- v) Define the term Mutagenicity.

b) Explain descriptive animal toxicity tests. [3]

Q6) Answer the following questions. [12]

- a) What are Allergic reaction? Explain with example.
- b) What are animal Toxins? Give examples.
- c) Explain Reversible Toxicity with the help of example.

Q7) Answer the following questions.

[12]

- a) Explain Dose response.
- b) Explain enzymes involved in DNA finger printing.
- c) What is Draize test?

Q8) Answer the following questions.

[12]

- a) Explain the following terms.
 - i) Immediate toxicity
 - ii) Delayed Toxicity
- b) Explain Idiosyncratic reaction.
- c) Write about Toxicity develop by solvents and vapours.

x x x

Total No. of Questions : 8]

SEAT No. :

PC3807

[6337]-401

[Total No. of Pages :2

S.Y.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-hand side indicate full marks.*

SECTION - I
(Neurochemistry)

- Q1)** Answer the following questions. [11]
a) Define the term 'neuroplasticity.' [3]
b) Explain the concept of sensory modalities. [4]
c) Explain the function of the myelin sheath. [4]
- Q2)** Write a short note on following [12]
a) Nerve cells and behavior
b) Cerebellum
c) Biochemistry of Circadian rhythms
- Q3)** Answer the following questions [12]
a) What are the main components of a synapse? [4]
b) Differentiate between afferent and efferent pathways. [4]
c) Name the major regions of the brain and their primary functions. [4]
- Q4)** Attempt the following questions (Any four) [12]
a) What is the significance of neurotransmitter reuptake? [3]
b) Define the blood-brain barrier and its importance. [3]
c) Explain the concept of long-term potentiation. [3]
d) Describe the mechanisms of action for NMDA receptors. [3]
e) What role do calcium ions play in neurotransmitter release? [3]

P.T.O.

SECTION - II
(Endocrinology)

Q5) Answer the following questions. [11]

- a) Explain the mechanism of action of cholera toxin on hormone signaling.[3]
- b) Discuss the impact of hormone overproduction on target cells. [4]
- c) How do feedback mechanisms regulate hormone levels in the body?[4]

Q6) Write a short note on following [12]

- a) Adenylate cyclase
- b) Platelet-derived growth factor (PDGF)
- c) Gastrointestinal hormones

Q7) Answer the following questions. [12]

- a) How does the body maintain calcium homeostasis through hormones?[4]
- b) Explain the role of thyroid hormones in growth and development. [4]
- c) Describe the effect of insulin. [4]

Q8) Attempt the following questions (Any four) [12]

- a) Explain the role of estradiol in reproductive functions. [3]
- b) Describe the role of growth hormones. [3]
- c) Write a note on ADH. [3]
- d) Explain the metabolism of catecholamine. [3]
- e) Why is the pituitary gland known as the master gland? [3]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

PC3808

[6337]-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) *Use separate answer paper sheets for both sections.*
- 2) *Questions no.1. and no.5. are compulsory.*
- 3) *Attempt any two questions from Q.No.2. to Q.No.4.*
- 4) *Attempt any two questions from Q.No.6. to Q.No.8.*
- 5) *Draw diagram wherever require.*

SECTION - I

Medical Biochemistry

Q1) a) Attempt any Four questions of the following.

[4×2=8]

- i) Define the term oncogenes.
 - ii) What are factors responsible to cause cancer?
 - iii) Define the terms apoptosis.
 - iv) Define the term Fibrinolysis.
 - v) What is Haemoglobinopathy?
- b) Explain the mode of action of lysosome phagocytosis using diagram.[3]

Q2) Attempt the following.

[12]

- a) Explain mode of action of chloramphenicol with the help of diagram. **[4]**
- b) Explain Intrinsic pathway of blood coagulation. **[4]**
- c) Write the short account on 'Thalassemia' with symptoms. **[4]**

Q3) Answer the following questions.

[12]

- a) What is mode of action of 'Resistance of Tetracyclins'. **[4]**
- b) Explain pinocytosis using diagram. **[4]**
- c) List the Enzymes used in assess the 'Coronary Heart Diseases'. **[4]**

P.T.O.

Q4) Answer the following questions. [12]

- a) What are cell wall inhibitors of bacteria? Explain mode of action.
- b) Explain the mechanism of action of 'Polyenes' when react with fungal memberane?
- c) Write short note on Sickle cell anemia.

SECTION - II

Physiological Biochemistry

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

- i) Define the term acidosis.
 - ii) What do you mean by the term alkalosis?
 - iii) Enlist the functions of kidney.
 - iv) What is role of 'Platelet' in blood clothing.
 - v) Enlist the functions of liver.
- b) What is Jaundice? Explain Types of Jaundice. [3]

Q6) Attempt the following questions. [12]

- a) Describe the steps involved in formation of urine using diagrams. [6]
- b) How Carbohydrates are digested? [2]
- c) Explain Intrinsic pathway of blood coagulation. [4]

Q7) Attempt the following questions. [12]

- a) Explain anatony of liver. [4]
- b) How proteins are digested? [4]
- c) What is respiratory acidosis explain with diagram. [4]

Q8) Attempt the following questions. [12]

- a) What is fibrinolysis? Explain. [4]
- b) How oxygen and carbondiaioxide is transported in blood. [4]
- c) Draw a diagram of Nephron and explain the function of Bowman's capsule. [4]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 3

PC3809

[6337]-403

M.Sc. - II

BIOCHEMISTRY

**BCH - 413 (B) : Clinical Nutrition and Food Technology
(2019 Pattern) (Semester - IV)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 and Q.5 are compulsory.*
- 2) *Attempt any two questions from Q.2 to Q.4.*
- 3) *Attempt any two questions from Q.6 to Q.8.*
- 4) *Use separate answer sheets for both sections.*
- 5) *Draw diagrams wherever necessary.*

SECTION - I

(Clinical Nutrition)

Q1) Answer the following questions. (any 4)

[4×2=8]

- a)
 - i) Define acidic and alkaline food.
 - ii) What is role of dietary fiber.
 - iii) What is malnutrition?
 - iv) What is food toxin?
 - v) List the different eating disorders?
- b) What is irradiation? Explain the effect of irradiation with dose, on the nutritional quality of food. **[3]**

Q2) Attempt the following questions.

[12]

- a) What is diabetic condition seen in body? Write about metabolic changes observe in this disorder. **[4]**
- b) Write short note on food allergy. **[4]**
- c) List effect of fermentation on quality as well digestion of food. **[4]**

P.T.O.

Q3) Answer the following questions. [12]

- a) Define the term Inborn error of metabolism. Explain management of any two errors with nutrition, food. [6]
- b) What is weight management? Give its importance. [4]
- c) Define the term food fadism. [2]

Q4) Answer the following questions. [12]

- a) Describe the nutritional status of dairy product in India. [4]
- b) What do you mean by refining of food? Explain its effects on food quality. [4]
- c) What is 'Kwashiorkor'? Enlist symptoms and causes of it. [4]

SECTION - II

(Food Technology)

Q5) a) Answer the following questions any four. [4×2=8]

- i) List any two important points of good laboratory practices in food technology laboratory.
 - ii) List the material used for food preservation.
 - iii) List the sources for 'starch' production.
 - iv) Define the term antioxidant with example.
 - v) List the food sweeteners used in food technology laboratory.
- b) Write short account on 'AGMARK'. [3]

Q6) Answer the following questions. [12]

- a) Differentiate between the 'Natural' and genetically modified food with examples and advantages, disadvantages. [6]
- b) Explain the role of enzymes in analysis of Glucose contents of food material. [4]
- c) Define the term spoilage of food. [2]

Q7) Attempt the following questions. [12]

- a) How will you process for production of starch? [4]
- b) Write short note on FSSAI. [4]
- c) What are food additives? Give examples with role of additive in food industry. [4]

Q8) Answer the following questions. [12]

- a) What are stabilizer? Give examples and application of stabilizers. [3]
- b) What do you mean by synthetic syrup? Write its uses. [3]
- c) Write short account on 'Weights and measures Act'. [3]
- d) What is meat tenderization? Write its advantages & disadvantages. [3]

