Total No. of Questions: 8]

SEAT No. : ____

P2467

[Total No. of Pages : 2

[6064]-111
M.Sc. - I
BIOCHEMISTRY
BCH-III : Bimolecules (Organic chemistry of living Beings)
(2019 Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***Q1 and Q5 are compulsory and carry 11 marks each.***
2) ***Attempt any two questions from Q2 and Q4 and two questions from Q6 to Q8.***
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 questions **[11]**

a) Give the structure and functions of Glycogen **[3]**

b) Discuss the structure and role of thiamine pyro phosphate **[4]**

c) Give the classification of Monosaccharides with suitable examples and structures **[4]**

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

a) Amino-sugars and their significance. **[4]**

b) Mutarotation with example. **[4]**

c) Phospholipids and their Biological role **[4]**

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

a) Discuss the structure and role of cellulose. **[4]**

b) Discuss the biochemical functions and defeciency of folic acid. **[4]**

c) Describe the role of storage lipids with examples. **[4]**

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

a) Give the structure and role of lactose. **[3]**

b) Give the reactions of Carbohydrates in presence of acid with example. **[3]**

P.T.O.

c) Differentiate between fats and oils **[3]**

d) Discuss the role of lipids in bilayer formation **[3]**

e) Explain isomerism in Carbohydrates **[3]**

SECTION-II

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

a) Write a note on rare amino acids with biological significance. **[3]**

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

c) Describe the Sangeri's method of protein sequencing. **[4]**

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

a) Ramachandran plot **[4]**

b) Biological functions of proteins **[4]**

c) Quaternary structure of proteins **[4]**

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

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

b) Give the difference between denaturation and proteolysis of protein with suitable example. **[4]**

c) Describe super secondary structure of proteins. **[4]**

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

a) Explain peptide bond shows double bond character. Give two features of peptide bond. **[3]**

b) Discuss the importance of hydrogen bond in Stabilizing the secondary and tertiary structure of Proteins. **[3]**

c) Describe the two methods for breaking Disulfide bonds in proteins. **[3]**

d) Explain conjugated protein with examples. **[3]**

e) Give the structure of three aromatic amino acids. **[3]**

Total No. of Questions : 8]

SEAT No. :

P-2468

[Total No. of Pages : 2

[6064]-112
F.Y. M.Sc. (BIO-CHEMISTRY)
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 on seperate answer books.***
2) ***Q.1 and Q.5 are compulsory. and carry 11 marks each.***
3) ***Attempt any two questions from Q.2 ot Q.4 and any 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) Describe in detail the principle of reverse dialysis. **[3]**

b) Explain the principle of thin layer chromatography. **[4]**

c) Give the principle of cellulose-acetate electrophoresis. **[4]**

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

a) Preparatory centrifuge **[4]**

b) Nitrocellulose filters **[4]**

c) Ubbelholds capillary viscometer **[4]**

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

a) Explain any two applications of dialysis. **[4]**

b) Explain different componants of biosensor. **[4]**

c) Explain principle of 2D gel electrophoresis. **[4]**

P.T.O.

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

a) What are the factors affecting viscosity of a solution. **[3]**

b) What are the factors affecting sedimentation velocity. **[3]**

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

d) What are different types of ligand matrix-system used in affinity chromatography. **[3]**

e) State the properties of different types of support mediums used in gel electrophoresis. **[3]**

SECTION - II

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

a) Define lambert-beer law? What are the reasons for it's deviations. **[3]**

b) Draw the instrumentation of polarisation of fluorescence. **[4]**

c) What are the different types of detectors used in spectrophotometer. **[4]**

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

a) MALDI **[4]**

b) Absorption spectrum **[4]**

c) Magnetic sector mass analyser **[4]**

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

a) What are different modes of vibrations of CO_2 molecule. **[4]**

b) Explain principle of circular diachroism. **[4]**

c) Explain the ionisation methods used in LCMS and GCMS. **[4]**

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

a) What is TOF in mass spectrophotometer? Give its applications. **[3]**

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

c) What are plane polarised light and circularly polarised light. **[3]**

d) Give the applications of UV-visible spectroscopy. **[3]**

e) Give applications of Atomic Absorption spectroscopy. **[3]**

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Total No. of Questions : 8]

SEAT No. :

P2469

[Total No. of Pages : 2

[6064]-113
F.Y. 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) ***Q1 and Q5 are compulsory and carry 11 marks each.***
2) ***Attempt any two question from Q2 to Q4 & two from Q6 to Q8.***
3) ***Answer to the two section should be written in separate answer book.***
4) ***Figures to the right indicate full marks.***

SECTION - I

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

a) What are cell adhesion molecule?

b) What is cytoskeleton? List its component.

c) Differentiate between Eukaryote and prokaryote.

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

a) Sub cellular fractionation

b) Fibronectin

c) Meiosis

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

a) Describe with diagram key aspect of plant cell.

b) Explain the process of mitosis.

c) Describe type of cell functions.

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

a) Comment an the types of fungi.

b) Draw and lable the ultra structure of an animal cell.

c) Explain the structure and function of mitochondria.

d) Describe the mechanism of cyclin and cyclin - depender kinase in regulation of cell cycle.

e) Explain the process of capitation reaction.

P.T.O.

SECTION - II

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

a) What is flip flop of lipid in the membrane?

b) With suitable example explain active transport.

c) What is Bulk transport? Give its types.

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

a) Membrane transport.

b) Diapharc

c) ABC transporter

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

a) Explain the working of ATP-ADP exchanger.

b) Describe fluid mosaic model.

c) With the help of illustration explain ligard gated channel.

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

a) What is valinomycin? Give its mechanism of action.

b) Describe phosphotransferase synthesis.

c) Explain the term membrane asymmetry and give its importance.

d) Explain how protein toxin get transported into the cell.

e) Describe the functioning of Na^+/K^+ AT pase.

Total No. of Questions : 4]

SEAT No. :

P2470

[Total No. of Pages : 2

[6064]-114
First Year 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.***

SECTION-I

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

a) Discuss in detail about types of enzymes based on its specificity. **[3]**

b) Discribe activation of chymotrypsinogen. **[4]**

c) Discuss the mechanism of bisubstrate reaction for enzyme catalysis. **[4]**

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

a) Site directed mutagenesis. **[4]**

b) measurement of Kd of an enzyme. **[4]**

c) Affinity labelling with suitable example. **[4]**

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

a) How to measure pre-steady state kinetics Give its importance. **[4]**

b) What is the significance of allosteric and co-operative behavior of an enzyme. **[4]**

c) Describe the role of three amino acids in the catalytic triad of chymotrypsin. **[4]**

P.T.O.

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

a) Give Michael's-Menten equation and define each term. **[3]**

b) Discuss the ubiquitin cycle for enzyme degradation. **[3]**

c) What is substrate cycle? Explain with suitable example. **[3]**

d) What is enzyme turnover? explain its significance. **[3]**

e) Explain the regulation of metabolic pathways by covalent modification of enzymes. **[3]**

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Total No. of Questions : 8]

SEAT No. :

P-2471

[Total No. of Pages : 3

[6064]-211

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 book.***
2) ***Question No. 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) ***Figure in the right side indicate full marks.***
4) ***Neat labelled diagrams are required whrever necessary.***

SECTION - I

(Carbohydrate and Lipid Metabolism)

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

i) Draw the structure of ATP.

ii) Write significance of PPP.

iii) Name the ketone bodies.

iv) Write about starch entry into Glycolysis.

v) Define the term free energy and Enthalpy.

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

Q2) **Attempt the following :**

a) Explain the feeder pathway of glycogen in glycolysis. **[4]**

b) Explain oxidative phosphorylation with the help of ETC and ATP synthase complex. **[6]**

c) Write the significance of glyoxylate cycle. **[2]**

P.T.O.

Q3) **Attempt the following :**

a) Explain the oxidation of Even number of fatty acid, palmitic acid. **[4]**

b) Explain HMP shunt. **[4]**

c) How glycolysis is regulated. **[4]**

Q4) **Attempt the following :**

a) Explain the structure of fatty acid synthese complex. **[4]**

b) Draw neat labelled diagram of Gamma-glutamyl cycle. **[3]**

c) Write the equation of energetics of complete oxidation of one glucose molecule. **[3]**

d) List the substrates of gluconeogenesis. **[2]**

SECTION - II

(Amino Acid and Nucleotide Metabolism)

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

i) What is difference between Salvage and denovo pathway.

ii) How 4A is generated in the body?

iii) Define the term proteolysis.

iv) Define the term transamination.

v) How PRPP is synthesized from Ribose-5 phosphate.

b) Explain the conversion of serine to glycine using tetrahydrofolate. **[3]**

Q6) **Attempt the following :**

a) Write the following equations : **[4]**

i) Histidine $\rightarrow$ histamine

ii) Tyrosine $\rightarrow$ Epinephrine

b) Explain the role of tetrahydro-biopterin in the conversion of phenyl alanine $\rightarrow$ Tyrosine. **[4]**

c) Explain the salvage pathway of punne nucleotide biosynthesis. **[4]**

Q7) **Attempt the following :**

a) Write the following conversion of **[4]**
α ketoglutarate $\rightarrow$ glutamale $\rightarrow$ glutamine.

b) With the help of reaction explain oxidative deamination. **[4]**

c) Explain the biosynthesis of urea. **[4]**

Q8) **Attempt the following :**

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

b) Write the following conversions :

i) IMP $\rightarrow$ GMP **[2]**

ii) VTP $\rightarrow$ CTP **[2]**

c) Write the regulation of pyrimidine nucleotide biosynthesis. **[4]**

Total No. of Questions : 8]

SEAT No. :

P2472

[Total No. of Pages : 2

[6064]-212

F.Y.M.Sc.

BIOCHEMISTRY

BCH-212-Genetics (Chemistry of Nucleic Acids)

(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) ***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 indicte full marks.***

SECTION-I

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

a) Explain multiple alleles with example. **[2]**

b) Explain epistasis and types of epistasis with examples. **[4]**

c) Explain the experiments performed by Avry MacLeod-McCarty and Hershey and chase to prove that DNA is genetic material. **[5]**

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

a) Recombination maps. **[4]**

b) Operon **[4]**

c) Mendelian laws of inheritance. **[4]**

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

a) What is fertility factor? How is it transferred from one bacterial cell to another? **[4]**

b) What are sex limited and sex influenced characters? **[4]**

c) Differentiate between types of RNA. **[4]**

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

a) Explain incomplete dominance and co-dominance with example. **[3]**

b) Draw the structure of t-RNA explain functions of t-RNA, mRNA and rRNA. **[3]**

c) Explain crossing over of genes. **[3]**

d) What is plasmid? Explain types of plasmid. **[3]**

e) Enlist any six contrasting characters of pea plant that mendel studied. Explain the terms genotype and phenotype. **[3]**

P.T.O.

SECTION-II

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

a) Give two examples each of chemical and physical mutagens. **[2]**

b) Describe migration and genetic drift. Affecting Hardy- Weinberg equilibrium. **[4]**

c) What are genetic disorders? Describe any two genetic disorders with its causes and symptoms. **[5]**

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

a) Fishers theorem. **[4]**

b) Human genetic analysis by pedigree. **[4]**

c) Bacterial transformation. **[4]**

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

a) Explain Hardy-Weinberg equation. **[4]**

b) Explain different elements of population genetics. **[4]**

c) Explain diagnostic took for human genetic disorders. **[4]**

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

a) Explain conjugation process. **[3]**

b) Describe spatial variation and genetic fitness. **[3]**

c) Explain Klinefilter syndrome. **[3]**

d) Explain population bottleneck with examples. **[3]**

e) Explain mutation with selection of mutants. **[3]**

Total No. of Questions : 8]

SEAT No. :

P-2473

[Total No. of Pages : 3

[6064]-213

F.Y. M.Sc.

BIOCHEMISTRY

BCH-213: Plant Biochemistry

(2019 Pattern) (Semester - II)

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

Instructions to the candidates :

1) ***Q1 & Q5 are compulsory & carry 11 marks each.***
2) ***Attempt any two questions from Q2 to Q4 & two question from Q6 to Q8.***
3) ***Answers to the two Section should be written in separate answer book.***
4) ***Figure to the right indicate full marks.***

SECTION - I

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

a) What is the Oxygen evolving complex?

b) Explain plant - plant communication.

c) What are the events talking place during fruit ripening?

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

a) Seed dormancy.

b) Plant pests.

c) Photosystem.

P.T.O.

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

a) Explain the molecular biology of source sink relationship in plants.

b) Draw the structure of chloroplast & indicate the location of dark & light reaction.

c) Describe biochemical changes occuring during germination.

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

a) What are the different pigments involved in photosynthesis? Comment on accessory pigment.

b) Explain biotic & abiotic stress.

c) Describe cyclic electron flow.

d) Explain how seed dormancy can be broken.

e) Comment on pharmaceutical & nutraceutical value of plant.

SECTION - II

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

a) What are ligning.

b) Explain the role of Magnesium in plant metabolism.

c) Explain the process of Sulphur assimilation.

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

a) RuBisCo.

b) Classification of secondary metabelite.

c) Seed storage proteins.

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

a) Discuss C3 cycle.

b) Describe Nitrogen cycle & comment on Nitrogenase.

c) What are alkaloids & how are they important?

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

a) Give the importance of micro nutrient in plant growth & development.

b) Discuss the role of abstisic acid in plant growth.

c) Describe C4 pathway.

d) Explain importance of gibberellic acid.

e) Explain the process of a senescence & abscission with respect to the hormones involved.

Total No. of Questions :4]

SEAT No. :

P2474

[Total No. of Pages : 2

[6064]-214

F.Y.M.Sc. (Biochemistry)

BCH-214 (A) : MICROBIOLOGY

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

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

Instructions to the candidates:

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

Q1) Answer the following questions:

a) Explain with well labelled diagram the structure of bacterial cell. **[2]**

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

c) Explain Physical agents used to control the growth of micro organisms with its applications. **[5]**

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

a) Nitrogen cycle in nature.

b) Lytic cycle of bacteriophage.

c) Electron microscopy.

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

a) Explain the classification of plant and animal viruses.

b) What are different types of media used to cultivate micro organisms.

c) Explain resistance and immunity against infecting microbes.

P.T.O.

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

a) Differentiate between endotoxin & exotoxin.

b) What are the characteristics studied for the bacterial colony?

c) Give the protocol for gram staining also explain the role of each chemical used.

d) What are the characteristics used to classify microorganisms?

e) Explain mycoplasmas and viriods.

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Total No. of Questions: 8]

SEAT No. : ____

P2475

[Total No. of Pages : 2

[6064]-311
M.Sc.-II
BCH-311 : BIOCHEMISTRY
Molecular Biology
(2019 Pattern) (Semester-III)

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

Instructions to the candidates:

1) ***Answer to the two sections should be writen in seqarate answer sheets.***
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 (QNo 6 to 8) from section II.***
3) ***Figures to the right side indicate full marks..***
4) ***Neat diagram must be drown wherever necessray.***

SECTION-I

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

i) What is a function of ligases enzyme.

ii) Define the term apoptosis.

iii) What is Rho factor.

iv) Define the term Replication.

v) Write the names of types of RNA.

b) With diagram explain the Discontineous synthesis of okazaki fragments. **[3]**

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

a) Explain Eukaryotic Tertiary complex of translation Initiation? write in short function of Elongation factors. **[6]**

b) Write short note on Ubiquitien. **[4]**

c) Define Exom and Introns. **[2]**

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

a) Explain alternative splicing and self splicing. **[4]**

b) Write the functions of RNA polymerases. **[4]**

c) With Example and function write about nonsence codon. **[4]**

P.T.O.

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

a) Define mobile genetic elements and DNA Repair Gene. **[4]**

b) Write short note on Tranposable element. **[4]**

c) Write short note on 3′ poly tailing. **[4]**

SECTION-II

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

i) Write a Role of MRNA in Translation.

ii) Define the term RNA splicying.

iii) Write Role of tRNA in Translation.

iv) What are ribosomes.

v) Define the term Introns and Exons.

b) Write short account on the Role of EF-Tu in E-coli during Translation. **[3]**

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

a) With the help of diagram explain initiation of Translation. **[6]**

b) Explain Shine - Dalgarno (SD) sequence. **[4]**

c) Write names of Inhibitors of Translation. **[2]**

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

a) Write a role of signal sequences in protein trafficking. **[4]**

b) Define the term post translational modification with one example. **[4]**

c) How Proteins are transport from ER To golgi. **[4]**

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

a) Explain Tertiary complex in Eukaryotic translation. **[4]**

b) write short account on promoters of Translation. **[4]**

c) Write short note on ubiquitin **[4]**

Total No. of Questions : 8]

SEAT No. :

P-2476

[Total No. of Pages : 2

[6064]-312

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 seperate answer books.***
2) ***Q.1 and Q.5 are compulsory and carry 11 marks each.***
3) ***Attempt any two question from Q.2 ot Q.4 and any two questions from Q.6 to Q.8.***
4) ***Figures to the right indicate full marks.***

SECTION - I

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

a) What is phagocytosis? Give two examples of phagocytotic cells. **[3]**

b) Describe MHC molecules in detail. **[4]**

c) Differentiate between innate and adaptive immunity with examples. **[4]**

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

a) Structure of thymus. **[4]**

b) Regulation of Ig gene. **[4]**

c) Structure of Ig molecule with labelled diagram. **[4]**

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

a) Describe the steps involved in production of monoclonal antibodies. **[4]**

b) Explain Class I & Class II. MHC genes. **[4]**

c) Discuss isotypes, allotypes and idiotypes with examples. **[4]**

P.T.O.

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

a) What are complements? Give three examples. **[3]**

b) Discuss any one functional analysis for cytokines? **[3]**

c) Describe antigen-antibody reaction in detail. **[3]**

d) Write a note on blood group substances. **[3]**

e) What is inflammation? Give symptoms of inflammation. **[3]**

SECTION - II

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

a) Explain rocket immunoelectrophoresis. **[3]**

b) How to vaccine work? Explain different types of vaccine with examples. **[4]**

c) Discuss antigen Presentation and processing by cytosolic pathway. **[4]**

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

a) Autoimmune diseases.

b) AIDS.

c) Tumor antigens.

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

a) List out the types of hypersensitivity reaction & give their features.

b) Explain principle, types and applications of ELISA.

c) Explain graft rejection and types of grafts in detail.

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

a) What are immuno deficiency diseases? List two examples.

b) What are interferons? Give its significance.

c) Discuss immuno-diffusion technique.

d) Differentiate between active & passive immunity.

e) Discuss the role of antigen presenting cells.

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Total No. of Questions : 8]

SEAT No. :

P2477

[Total No. of Pages : 2

[6064]-313
M.Sc. - II
BIOCHEMISTRY
CCTP-9, BCH-313 : Recombinant DNA Technology
(2019 Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Answers to the two sections should be written on secparate 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 questions. **[11]**

a) Explain the plasmid vector PBR322. **[2]**

b) What are shuttle vectors? Explain any one shuttle vector with its importance. **[4]**

c) Describe transformation. What is the role of calcium chloride and 42°C heat shock in the transformation process. **[5]**

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

a) Construction of CDNA library.

b) Production of recombinant protein in eukaryotes.

c) Vectors of plants.

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

a) Give the protocol to purify DNA from plant material with role of each chemical used.

b) Explain MB bacteriophage as a vector and its significance.

c) With well labelled diagram explain the concept of gene cloning with its applications.

P.T.O.

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

a) Explain DNA modifying enzymes used in recombinat DNA technology.

b) Explain the characteristics of good vector.

c) What are cosmids? Explain with diagram one example of cosmid.

d) Explain transfection.

e) Write a note on screening of recombinant cells when bacteriophages are used as vectors.

SECTION - II

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

a) What are the proposed benefits of Human Genome Project. **[2]**

b) Explain any two types of PCR with its applications. **[4]**

c) What is qPCR? Explain delta-delta Ct method used to analyze gene expression. **[5]**

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

a) Types of PCR.

b) Blotting techniques.

c) Transgenic animals.

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

a) Describe pyrosequencing.

b) Explain steps in PCR and applications of PCR.

c) Write a note on miRNA.

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

a) Explain zinc finger nuclease.

b) Explain GUS assay.

c) Explain proteome and its applications.

d) Explain PCR based protein engineering.

e) Describe need and approach of genome mapping.

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Total No. of Questions : 8]

SEAT No. :

P2478

[Total No. of Pages : 4

[6064]-314
S.Y. 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) ***Q.1 and Q.5 are compulsory.***
2) ***Answer to the two sections should be written in seperate answer sheets.***
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 indicate full marks.***

SECTION-I
(Bioprocessing)

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

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

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

c) Explain the role of chromatography in product recovery. **[5]**

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

a) Strain improvement **[4]**

b) Methods of media sterilization. **[4]**

c) Methods of preservation of industrial micro organisms. **[4]**

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

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

b) How penicillin is manufactured by fermentation process. **[4]**

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

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

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

b) Explain various methods of feedback control. **[3]**

c) What are antifoaming agents? Give their role. **[3]**

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

e) What are different types of aggitators. **[3]**

P.T.O.

SECTION-II

(Industrial Biochemistry)

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

a) Discuss various physical & chemical agent's used for sterilization. **[3]**

b) What are cytokinines? Give their role. **[3]**

c) Give characteristics of transformed cell line. **[5]**

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

a) Cryopreservation. **[4]**

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

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

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

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

b) Give the role of following component in media. **[4]**

i) Serum

ii) Tryptophan

iii) Insuline

iv) Biotine

c) What are heterokaryone & varient cell. Give Exaple. **[4]**

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

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

b) What is hairy root culture. **[3]**

c) Define cell banking? Give its importance. **[5]**

d) Describe protoplast fusion. **[5]**

e) Give advantages of natural media. **[5]**

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Total No. of Questions : 8]

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[6064]-314

S.Y. M.Sc.

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) ***Answer to the two sections should be written in seperate answer books.***
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 indicate full marks.***

SECTION-I

(Pharmacology)

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

a) Write classification of ADR. **[3]**

b) Define Hill coefficient and pharmacodynamics. **[4]**

c) Define EC50 and E max. **[4]**

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

a) Agonist.

b) Phase I and Phase II reactions.

c) Pharmacokinetics.

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

a) How are drugs classified based on their effects?

b) How are adverse drug reactions diagnosed?

c) What are the challenges in drug development?

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

a) What is drug absorption? Explain passive diffusion.

b) What is purpose of drug classification? Explain the pharmacology classification of drugs.

c) Explain several types of unwanted effects shown by various drugs.

SECTION-II

(Forensic Biochemistry)

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

a) What is Draize test? **[3]**

b) What are ontogenetic bioassays? **[4]**

c) Explain different areas of toxicology. **[4]**

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

a) Selective toxicity

b) Mutagenicity

c) Idiosyncratic reactions

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

a) Explain in detail reactions involved in phase I biotrasformation reaction.

b) Explain dose response relatiosship between different doses of organophosphate insecticide.

c) Explain the process and consequences of epigenetic regulation of gene expression.

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

a) Write the detail account of chronic exposure.

b) What are the general characteristics of the toxic response?

c) What are the major routes by which toxic agents gain access to the body?

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Total No. of Questions : 8]

SEAT No. :

P-2479

[Total No. Of Pages : 3

[6064]-411

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 on separate answer books.***
2) ***Q.1 and Q.5 are compulsory***
3) ***Attempt any 2 questions from Q.2 to Q.4 and any Two questions from Q.6 to Q.8.***
4) ***Figures to right indicate full marks.***

SECTION - I

(Neurochemistry)

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

a) What is circadian rhythm? Explain the role of biomolecules involved in circadian rhythm. **[2]**

b) What are sensory circuits? Discuss the different components involved in it. **[5]**

c) Describe the components of central nervous system. **[4]**

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

a) Sensory receptor **[4]**

b) Cerebrospinal fluid **[4]**

c) Sensory perception **[4]**

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

a) Explain the synthesis and action of any two neurotransmitters? **[4]**

b) Define synapse? Explain the different components involved in the formation of synapse. **[4]**

c) Describe the role of CAM kinase II, calcium, CAMP and calpain in memory and learning. **[4]**

P. T. O

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

a) Describe the functions of spinal cord **[3]**

b) What are neuroglia? Enumerate it's different types with their functions. **[3]**

c) Differentiate between sympathetic and parasympathetic divisions of autonomic nervous system. **[3]**

d) What are Cranial Nerves? Give their types with example. **[3]**

e) Explain the different components of brain stem. **[3]**

SECTION - II

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

a) Discuss the role of platelet derived growth factor. **[3]**

b) What are the biochemical effects and clinical manifestation of aldosterone **[4]**

c) Explain intercellular and extracellular receptors with respect to hormones with suitable examples. **[4]**

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

a) Role of cGMP in heart all and kidney cell **[4]**

b) Gastro intestinal hormone with two examples **[4]**

c) Mechanism of TRH and TSH. **[4]**

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

a) Give the details of mode of action of steroid hormones in regulation of gene expression. **[4]**

b) Give the details of role of calcitonin and hera thyroid hormones. **[4]**

c) Discuss transport, metabolism and regulation of insulin. **[4]**

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

a) Discuss the mode of action of epinephrine **[3]**

b) Write a short note on antidiuretic hormone **[3]**

c) Discuss disorders related to growth hormone **[3]**

d) Explain growth hormone is glucogenic glycogenolytic and ketogenic? **[3]**

e) Discuss the role of Inositol triphosphate in mode of action of hormone. **[3]**

Total No. of Questions : 8]

SEAT No. :

P2480

[Total No. of Pages : 3

[6064]-412

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 book.***
2) ***Question number 1 and 5 are compulsory out of remaining attempt any two questions Q.no2 to 4) from section-I and any two questions Q.no.6 to 8 from Section-II***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION-I

(Medical Biochemistry)

Q1) a) Attempt any four of the following: **[8]**

i) Write the names of isoenzymes used in the detection of coronary heart diseases.

ii) Why lysosome are termed as 'senicidal bags'?

iii) Define the term proto oncogences.

iv) Write the names of various types of Influenza.

v) List the symptoms of malaria.

b) Write the Mode of action of antibiotic penicillin. **[3]**

Q2) Attempt the following :

a) Discuss the mechanism of protein synthesis inhibition by various antibiotics. **[6]**

b) Explain Etiology of cancer. **[4]**

c) Write the names of enzymes present in lysosome. **[2]**

P.T.O.

Q3) Attempt the following:

a) Explain the malaria cycle. **[4]**

b) Write the biochemical mechanism involved in tangles and plagues formation in alzheimer. **[4]**

c) Write the mode of action of antifungal drugs. **[4]**

Q4) Attempt the following:

a) Elaborate the haemoglobinopathics. **[4]**

b) Write short account on the resistance of antibiotics. **[4]**

c) Write about extrinsic pathway of apoptosis. **[4]**

SECTION-II

(Physiological Biochemistry)

Q5) a) Attempt the following of any four: **[8]**

i) Write the functions of liver.

ii) What are main functions of kidney.

iii) Write the names of conditions that causes excessive bleeding in human.

iv) Write the names of buffer system which control the normal pH in the body.

v) Write the function of mineral sodium.

b) What is Jaundice? Elaborate different types of jaundice. **[3]**

Q6) Attempt the following:

a) List the liver functions test to assess the disease condition of liver. **[4]**

b) With the help of diagram explain 'Nephron'. **[4]**

c) Write the role of vitamin K in clothing process. **[4]**

Q7) Attempt the following:

a) Write short note on respiratory acidosis. **[4]**

b) Which diagnostic test are used in kidney function. **[4]**

c) Write about the digestion of carbohydrates. **[4]**

Q8) Attempt the following:

a) How proteins are digested, elaborate answer. **[4]**

b) Write about the mechanism of formation of thrombin. **[4]**

c) Write short note on bohr effect. **[4]**

Total No. of Questions : 8]

SEAT No. :

P-2481

[Total No. of Pages : 3

[6064]-413

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 question from Q.2 ot Q.4 and any two questions from Q.6 to Q.8.***
4) ***Figures to the right indicate full marks.***

SECTION - I

(Clinical Nutrition)

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

a) What are the different methods of cooking. Explain their effect on nutritional quality of food. **[4]**

b) Name the different eating disorders. **[2]**

c) What are metabolic adaptations seen during muscle exercise. **[5]**

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

a) Importance of dietary fibers. **[4]**

b) Nutritional anaemia & it's effect. **[4]**

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

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

a) What are in born errors of metabolism? Explain management of any two errors. **[4]**

b) Explain the parameters to access PEM. **[4]**

c) What is diabetics mellietus? What are physiological changes occur in it. **[4]**

P.T.O.

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

a) Describe the relationship between dietary cholesterol and Lipid metabolism. **[3]**

b) Name different secretions of digestive glands and their role. **[3]**

c) Name different agencies and their role in supplementary nutritional programme. **[3]**

d) Name causes, symptoms and treatment of albinism. **[3]**

e) What is weight management? Give its importance. **[3]**

SECTION - II

(Food Technology)

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

a) What is importance of Good Laboratory practices. **[3]**

b) Give the principles of food preservation. **[4]**

c) How will you manufacture natural and synthetic sweetness. (Any two). **[4]**

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

a) Biochemistry behind food spoilage. **[4]**

b) Enzymes in fruit juice technology. **[4]**

c) Starch production from maize. **[4]**

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

a) What are GMF's? Give their importance. **[4]**

b) What are different types of plant and animal originated food spoilage. **[4]**

c) Explain the role of enzymes used in analysis of food glucose. **[4]**

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

a) Give the role of FSSAI, AGMARK & BIS. **[3]**

b) What is role of floor bleaching & manufacturing agent. **[3]**

c) What are food additives? Enlist their roles. **[3]**

d) Give the importance of SOP. **[3]**

e) Explain mechanism of action of propionic acid and propionates against micro-organisms as food preservative. **[3]**

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