Total No. of Questions : 8]

SEAT No. :

PA-3224

[Total No. of Pages : 2

[5910]-11

M.Sc.

BIOCHEMISTRY

BCH - 111 : BIOMOLECULES (Organic Chemistry of Living Beings)

(2019 Pattern) (Semester - I) (CBCS)

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 side indicate full marks***

SECTION - I

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

a) Give the structure and functions of triacyl glycerol. **[3]**

b) Discuss the biochemical functions and deficiency of riboflavin. **[4]**

c) Give the classification of fatty acids with suitable examples. **[4]**

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

a) Deoxy sugars and their significance. **[4]**

b) Fat soluble vitamins. **[4]**

c) Lipoproteins and their significance. **[4]**

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

a) Describe biological significance of carbohydrates. **[4]**

b) Discuss the role of structural lipids in membrane. **[4]**

c) Explain structure and role of starch in plants. **[4]**

P.T.O.

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

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

b) What is micelle? Give its functions. **[3]**

c) What are epimers? Give the examples with structure. **[3]**

d) Describe rancidity with example. **[3]**

e) What are coenzymes? Give three examples. **[3]**

SECTION - II

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

a) Loss of protein structure results in loss of function, justify. **[3]**

b) Explain why peptide bond is rigid and planar? **[4]**

c) Give the principle and procedure of solid phase synthesis of oligopeptides. **[4]**

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

a) Denaturation and renaturation of proteins. **[4]**

b) End group analysis. **[4]**

c) Protein sequencing by Edman. **[4]**

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

a) Explain the tertiary structure of proteins with the help of unfolding/ refolding experiment. **[4]**

b) Give details of globular proteins with suitable examples. **[4]**

c) Classify proteins based on their biological function. **[4]**

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

a) Give the structure of three basic amino acids. **[3]**

b) Discuss β - Sheet structure of proteins. **[3]**

c) differentiate between simple and conjugated proteins. **[3]**

d) List essential and non-essential amino acids. **[3]**

e) Explain different structural motifs in protein structure. **[3]**

Total No. of Questions : 8]

SEAT No. : ____

PA-3225

[Total No. of Pages : 2

[5910]-12

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 on 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) What is SDS? What are it's functions in SDS-PAGE? **[3]**

b) Differentiate between first generation and second generation biosensor. **[4]**

c) Differentiate between boundary sedimentation and zonal sedimentation. **[4]**

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

a) Polycarbonate filters. **[4]**

b) Gas-solid chromatography. **[4]**

c) Isoelectric focusing. **[4]**

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

a) Explain the principle of separation of molecules in ion exchange chromatography? **[4]**

b) How proteins can be purified by using gel electrophoresis. **[4]**

c) Which chromatography technique is used for the purification of DNA. **[4]**

P.T.O.

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

a) Name any two cation exchangers & anion exchangers.

b) What are different types of biosensors.

c) What are different methods used for measurement of viscosity

d) Give applications of HPLC.

e) What is mean by activation & regeneration of an adsorbent.

SECTION - II

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

a) Differentiate between ORD and CD spectroscopy technique. **[3]**

b) Differentiate between spectrofluoremetry and spectrophotometry. **[4]**

c) Differentiate between LCMS & GCMS. **[4]**

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

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

b) MALDI. **[4]**

c) Quadrapole mass analyser. **[4]**

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

a) Explain the principle of UV-Visible spectroscopy. **[4]**

b) Explain the principle of IR spectroscopy. **[4]**

c) Explain the principle of NMR spectroscopy. **[4]**

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

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

b) Define the term fluor? Name extrinsic and intrinsic fluor. **[3]**

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

d) Give the application of UV-Visible spectroscopy. **[3]**

e) Give the application of AAS spectroscopy. **[3]**

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Total No. of Questions : 8]

SEAT No. :

PA-3226

[Total No. of Pages : 2

[5910]-13
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) a) What are communication function.

b) What is Yeast? Give its importance.

c) Draw structure of animal cell.

[11]

Q2) a) Meosis

b) Extracellular matrix.

c) Spermatogenesis.

[12]

Q3) a) Explain the structure & function of mitochondria.

b) Describe differential & density gradient centrifugation.

c) Explain the importance of collagen & comment on its structure.

[12]

Q4) a) Explain capacitation & acrosome reaction. (any 4)

b) Explain the function of Galgi apparatus.

c) With the help of neat & lable diagram describe the structure of plasmodesmata.

d) Explain cell cycle.

e) What is cell wall? Explain their types in biological system.

[12]

P.T.O.

SECTION - II

Q5) a) What is gramicidin?

b) What are the component of biological membrane?

c) Explain with example group translocation.

[11]

Q6) Short note :

a) Bulk transport

b) Fluid - mosaic model.

c) Cholera toxin

[12]

Q7) a) Explain different types of transport across the membrane.

b) Discuss different types of channels.

c) Describe ATP-ADP exchanger.

[12]

Q8) a) What are flipase? Give their importance. (any 4)

b) Describe ABC transporter & their importance.

c) Explain $Na^+ – K^+$ At pase role in maintaining membrane potential.

d) What is selective permeability of the cell?

e) Explain the role of transporter in cystic fibrosis.

[12]

Total No. of Questions : 4]

SEAT No. : ____

PA-3227

[Total No. of Pages : 2

[5910]-14

M.Sc. (Biochemistry)

BCH - 114 : ENZYMOLOGY

(2019 Pattern) (Semester - I) (CBCS)

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 questions: **[11]**

a) Explain why ser - 195 of chymotrypsin is super reactive. **[3]**

b) How pre - steady state kinetics is studied? Give its significance. **[4]**

c) Discuss acid - base catalysis. **[4]**

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

a) Effect of change in substrate concentration on enzyme catalyzed reaction. **[4]**

b) Ubiquitin mediated protein degradation. **[4]**

c) Allosteric behaviour of phosphofructokinase. **[4]**

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

a) Explain types of enzyme inhibition with an suitable example. **[4]**

b) Discuss proximity and orientation effects on enzyme catalysis. **[4]**

c) What is the significance of change in pH on enzyme catalyzed. **[4]**

P.T.O.

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

a) Explain significance of enzyme turnover. **[3]**

b) Define apoenzyme, coenzyme and isoenzyme. **[3]**

c) Explain double displacement method. **[3]**

d) Discuss the features of KNF and MWC models. **[3]**

e) Describe radio isotope equilibrium technique. **[3]**

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Total No. of Questions : 8]

SEAT No. :

PA-3228

[Total No. of Pages : 3

[5910]-21

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) ***Figures to the right side indicate full marks.***
4) ***Neat diagrams must be drawn wherever required.***

SECTION-I

(Carbo Hydrate and LIPID Metabolism)

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

i) List the inhibitors of ETC.

ii) Write the significances of ATP.

iii) What is importants of pentose phosphate pathway.

iv) How ketone bodies are formed in the body.

v) Define the term Entropy and Enthalpy.

b) How glycogen make entry is the glycolysis to fullfill the energy requirement of the body. **[3]**

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

a) Draw neat diagram of gamme glutamyl cycle with explanation. **[4]**

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

c) What is a major difference between α, β and ω. (alpha, beta and omega) oxidation of fatty acid. **[2]**

P.T.O.

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

a) Explain the priming reactions of glycolysis. **[4]**

b) How TCA cycle is regulated in Excess of ATP and NADH? When NADH and ATP are insufficient. **[4]**

c) Discuss the role of glycogensis in the synthesis of glycogen. **[4]**

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

a) Give the reactions involve in complete oxidation of palmitoyl-COA. **[4]**

b) How gluconeogenesis is regulated discuss the control point. **[4]**

c) Draw structure of ATP. **[2]**

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

SECTION-II

(Amino Acid and Nucleotide Metabolism)

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

i) Define the term de-nova pathway.

ii) What is transamination.

iii) Write a reaction showing oxidative deamination.

iv) Explain the form proteolysis.

v) Write the following conversion

Ribose 5-phosphate $\rightarrow$ phosphoribosyl-pyrophosphate.

b) How Ribonucleotide reductase catalyses the formation of deoxyribonucleotide explain reaction. **[3]**

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

a) How toxic ammonia is converted to urea. Explain. **[6]**

b) Explain the role of tetrahydrofolate with reaction. **[4]**

c) Write the reaction of, UTP $\rightarrow$ CTP. **[2]**

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

a) Explain the role of tetrahydrobiopterin in the conversion of phenylalanine to tyrosine. **[4]**

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

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

IMP $\rightarrow$ GMP.

Chorishmate $\rightarrow$ phenyl alonine.

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

a) Discuss the catabolism of uA. **[4]**

b) Write the conversion of

UMP $\rightarrow$ UDP $\rightarrow$ UTP **[4]**

c) How tetrahydrofolate work as a one carbon transfer explain its function. **[4]**

Total No. of Questions :8]

SEAT No. :

PA-3229

[Total No. of Pages : 3

[5910]-22

M.Sc.-I

BIOCHEMISTRY

CCTP-5 BCH-212 : Genetics (Chemistry of Nucleic Acid)

(2019 Pattern) (Semester-II)

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

Instructions to the candidates:

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

SECTION-I

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

a) Define **[2]**

i) Genotype

ii) Phenotype

b) Differentiate between different forms of DNA. **[4]**

c) What is recombination? Explain with example gene mapping by recombination **[5]**

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

a) Mendel's law of independent assortment.

b) Epistasis.

c) Lac operon.

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

a) Explain sex limited and sex influenced characters.

b) Explain multiple alleles with example of blood groups.

c) Explain the process to transfer fertility factor from one bacterial cell to another.

P.T.O.

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

a) Give structural similarities and differences between DNA and RNA.

b) Explain mendel's law of segregation with example.

c) Explain alleles and pseudoalleles with example.

d) Explain linkage and linkage groups.

e) Explain Hershey and chase experiment to prove that DNA is hereditary material.

SECTION-II

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

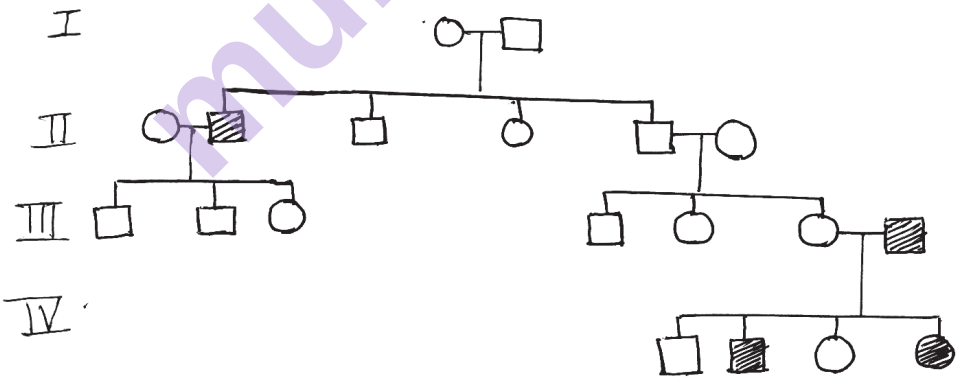
a) Define: **[2]**

i) Auxotroph

ii) Prototroph

b) What are the factors affecting Hardy-Weinberge equilibrium. **[4]**

c) Find the genotype of every individual in following pedigree. **[5]**



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

a) Population bottlenecks.

b) Down's syndrome.

c) Transduction.

Q7) Attempt the Following: **[12]**

a) Give genetic approach to diabetes.

b) Explain genetic variation and genetic drift.

c) Explain isolation and selection of auxotropic mutants.

Q8) Attempt any four for the following **[12]**

a) Write a note on Alzheimer's disease.

b) Explain Fishers theorem.

c) Explain any two chemical agents that cause multations.

d) Explain conjugation in bacteria

e) Write about the tools and techniques used for diagnosis of human generic disorders.

Total No. of Questions : 4]

SEAT No. :

PA-3231

[Total No. of Pages : 2

[5910]-24

M.Sc. - I

BIOCHEMISTRY

CBOP-2 - BCH-214(A) : Microbiology (Elective option)

(2019 Pattern) (Semester-II)

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

Instructions to the candidates:

1) ***Q.No.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 electron microscopy. **[4]**

c) Explain biochemical 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) Specimen preperation for flurocence microscopy.

c) Reproduction and growth of microorganisms.

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

a) Differentiate between endotoxin and exotoxin.

b) Give the protocol of acid fast staining and explain role of each chemical used.

c) Explain the role of moist heat in order to sterilize media.

P.T.O.

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

a) Differentiate between prokaryotic cell and eukaryotic cell.

b) What is synchronous growth? Why is necessary to have synchronous culture?

c) Explain Freeze fracture method.

d) Give the mechanism of action of phenolic compounds to control microbial growth.

e) Give the life cycle of HIV.

Total No. of Questions : 8]

SEAT No. :

PA-3232

[Total No. of Pages : 3

[5910]-31

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 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 (Q. No. 6 to 8) from Section - II.***
3) ***Figures to the right hand side indicate full marks.***
4) ***Neat diagram must be drawn wherever necessary.***

SECTION - I

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

i) Write the function of Enzyme helicase.

ii) What is a role of ligase?

iii) What is importants of topoisomerase?

iv) Define the term DNA repair gene.

v) What do you mean by Rho factor?

b) How okazaki fragments are generated? **[3]**

Q2) Attempt the following :

a) Explain the mechanism of Direct Repair and Base Excision repair. **[6]**

b) Write short account on inhibitors of transcription. **[4]**

c) What is function of DNA polymerase I? **[2]**

P.T.O.

Q3) Attempt the following :

a) Write short note on RNA polymerases. **[4]**

b) What is 3 poly tailing describe in detail? **[4]**

c) Elaborate role of P53 gene in apoptosis. **[4]**

Q4) Attempt the following :

a) Write short account on Mismatch Repair. **[4]**

b) What is spliceosome? Elaborate answer. **[4]**

c) Role of Transcription factor is important to initiation Elaborate and Justify. **[4]**

SECTION - II

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

i) Define the term Exon.

ii) What is futons?

iii) How will you define protein glycosylation?

iv) Define the term Translation.

v) What is function of mRNA in Translation?

b) Give importance of EF-TU in E-coli during Translation. **[3]**

Q6) Attempt the following :

a) Explain Eukaryotic 'Tertiary Complex' of translation initiation. **[6]**

b) Explain the signal hypothesis in protein targeting. **[4]**

c) What is Myosin? **[2]**

Q7) Attempt the following :

a) Write short account on promoters of Translation. **[4]**

b) How proteins are transfer for degradation? **[4]**

c) Write short account on amino acid tRNA synthetase. **[4]**

Q8) Attempt the following :

a) Write a note on targetting of protein to WER. **[4]**

b) Role of CRISPR-Casa in genome protection & Editing. **[4]**

c) Elaborate the Epigenetic modification. **[4]**

▽▽▽▽

Total No. of Questions : 8]

SEAT No. :

PA-3233

[Total No. of Pages : 2

[5910]-32

S.Y.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 on 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 indicates full marks.***

SECTION - I

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

a) What are super antigens? Give examples. **[3]**

b) Explain the structure and types of Toll-like receptors (TLR's). **[4]**

c) Discuss the role of cytokines in cross regulation of T_H Cells. **[4]**

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

a) MHC Class I and Class II molecules.

b) Antibody genes and antibody engineering.

c) Types of (Ig) Immunoglobulins.

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

a) What is innate immunity? Give the mechanism barriers involved against infection.

b) Justify "T Cells and B Cells differ in their susceptibility to tolerance induction".

c) Discuss primary and secondary lymphoid organs.

P.T.O.

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

a) Describe in short about clonal selection theory of antibody production.

b) Explain classical pathway of complement mechanism.

c) List the cells involved in cellular immune response.

d) What are constant and variable regions of antibody?

e) Explain complete and incomplete adjuvants.

SECTION - II

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

a) What are subunit vaccines? Give examples. **[3]**

b) Elaborate on biochemical basis of autoimmune diseases. **[4]**

c) Explain the principle, procedure and applications of ELISA. **[4]**

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

a) Type I hypersensitivity.

b) Attenuated vaccines.

c) CHIP assay.

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

a) Discuss primary B cell immunodeficiency diseases.

b) Discuss antigen presenting and processing by endocytic pathway.

c) What are tumor antigens and give classes of tumor antigens.

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

a) Describe passively acquired immunity with example.

b) Explain delayed type of hypersensitivity reactions.

c) Draw the structure of HIV.

d) Write a note on immuno electrophoresis.

e) List out types of graft for transplantation.

▽▽▽▽

Total No. of Questions : 8]

SEAT No. :

PA-3234

[Total No. of Pages : 2

[5910]-33

M.Sc. (Semester - III)

BIOCHEMISTRY

BCH - 313 : Recombinant DNA Technology

(2019 Pattern)

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

Instructions to the candidates :

1) ***Answer to the two Sections should be written on 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 questions : **[11]**

a) Give the source and recognition Sequence of EcoRI and Hind III. **[2]**

b) Describe different types of E.coli vectors. **[4]**

c) Describe with well labelled diagram the process of transformation. **[5]**

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

a) α - complimentation. **[4]**

b) Viruses as cloning vectors for mammals. **[4]**

c) Gene Cloning. **[4]**

Q3) Write a short answer of following : **[12]**

a) Why is it necessary to isolate DNA from animal? Give the flow chart representing DNA isolation from mammalian tissue. **[4]**

b) Describe construction of genomic DNA library and its significance. **[4]**

c) Describe yeast cloning vectors. **[4]**

P.T.O.

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

a) Explain the role of phosphatases, kinases and Taq polymerases in genetic engineering. **[3]**

b) Explain the role of Ti plasmid in production of transgenic plants. **[3]**

c) Explain strategies of using insect vectors. **[3]**

d) Explain the advantage of sticky ended DNA molecule over blunt ended. **[3]**

e) Write a note on cosmid and significance of cos site. **[3]**

SECTION - II

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

a) Explain gene transfer strategies used to produce transgenic animal. **[3]**

b) Write a note on reporter gene. **[4]**

c) Give applications of protein engineering. **[4]**

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

a) In vitro mutagenesis. **[4]**

b) RFLP. **[4]**

c) Genome editing. **[4]**

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

a) Explain pest resistance with example. **[4]**

b) What is transcriptome & proteome. **[4]**

c) Explain applications of PCR. **[4]**

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

a) Explain application of recombinant DNA technology in medicine. **[3]**

b) Give the application of Northern and Southern blotting techniques. **[3]**

c) Describe chain termination method of DNA sequencing. **[3]**

d) Give application & proposed benefits of Human Genome Project. **[3]**

e) With example explain transgenic animal production. **[3]**

▽▽▽▽

Total No. of Questions : 8]

SEAT No. :

PA-3235

[Total No. of Pages : 4

[5910] - 34
M.Sc. (Semester - III)
BIOCHEMISTRY
BCH - 314 (A) : Bioprocessing and Industrial Biochemistry
(2019 Pattern)

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

SECTION-I

Q1) **Answer the following questions:**

a) Explain the role of agitation and aeration in fermentation process. **[3]**

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

c) Explain design of fermenter. **[5]**

Q2) **Write a short note on following:**

a) Auxotropic mutant isolation. **[4]**

b) Strain improvement methods. **[4]**

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

Q3) **Answer the following questions:**

a) What are the effect of precursors in fermentation. **[4]**

b) Define continuous culture with example. **[4]**

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

Q4) **Attempt the following questions (any four) :**

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

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

P.T.O.

c) Give the characteristics of industrial micro-organism. **[3]**

d) Give the steps involved in Beer production. **[3]**

e) What is cephalosporine? Give its application. **[3]**

SECTION - II

Q5) **Answer the following questions:**

a) What are cytokinines? Give Roles. **[3]**

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

c) Describe media preparation and sterilization technique in tissue culture. **[5]**

Q6) **Write a short note on following:**

a) Cryopreservation **[4]**

b) Maintenance of fibroblast culture. **[4]**

c) Somaclonal variation & their importance. **[4]**

Q7) **Answer the following questions:**

a) Describe characteristics of primary cell culture and established cell line. **[4]**

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

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

i) Serum

ii) Tryptophan

iii) Insulin

iv) Biotin

Q8) **Attempt the following questions (any four):**

a) What are advantages of serum as constituent in culture media. **[3]**

b) Describe protoplast fusion. **[3]**

c) Define phytochemical? Give their importance. **[3]**

d) Give advantages of Natural media. **[3]**

e) Describe somatic cell hybridization. **[3]**

Total No. of Questions : 8]

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[5910] - 34
M.Sc. (Semester - III)
BIOCHEMISTRY
BCH - 314 (B) : Pharmacology and Forensic Biochemistry
(2019 Pattern)

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 indicate full marks.***

SECTION - I

(Pharmacology)

Q1) **Attempt the following:**

a) Write the importance of biochemistry in pharmacology. **[3]**

b) Write drug receptor interaction and binding forces involved in it. **[4]**

c) Define agonists and antagonists. What are the types of agonist drugs? **[4]**

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

a) Hill coefficient.

b) Drug interactions.

c) Adverse drug reaction.

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

a) Explain pharmacogenomics.

b) Explain apparent volume of distribution, half life and clearance of drug.

c) Write the mechanism of any one drug action.

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

a) What are the challenges in drug development?

b) Explain pharmakokinetics.

c) Explain sign, symptoms and treatments of adverse drug reactions.

P.T.O.

SECTION - II

(Forensic Biochemistry)

Q5) **Answer the following:**

a) How dermal irritation test is performed? **[3]**

b) Explain in detail Phase-II biotransformation reaction. **[4]**

c) Explain the enzymes involved in DNA finger printing. **[4]**

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

a) Cytochrome P-450 monooxygenase system.

b) Allergic reactions.

c) Idiosyncratic reactions.

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

a) Explain descriptive animal toxicity tests.

b) Explain local and systemic toxicity.

c) Write an account on mutagenecity.

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

a) Define the following

i) Acute lethality.

ii) Sub acute toxicity

iii) Sub chronic toxicity.

iv) Chronic toxicity

b) Write the applications of toxicology in forensic science.

c) Write the roles of enzymes in forensic biochemistry.

Total No. of Questions : 8]

SEAT No. :

PA-3235

[Total No. of Pages : 4

[5910] - 34
M.Sc. (Semester - III)
BIOCHEMISTRY
BCH - 314 (A) : Bioprocessing and Industrial Biochemistry
(2019 Pattern)

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

SECTION-I

Q1) **Answer the following questions:**

a) Explain the role of agitation and aeration in fermentation process. **[3]**

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

c) Explain design of fermenter. **[5]**

Q2) **Write a short note on following:**

a) Auxotropic mutant isolation. **[4]**

b) Strain improvement methods. **[4]**

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

Q3) **Answer the following questions:**

a) What are the effect of precursors in fermentation. **[4]**

b) Define continuous culture with example. **[4]**

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

Q4) **Attempt the following questions (any four) :**

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

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

P.T.O.

c) Give the characteristics of industrial micro-organism. **[3]**

d) Give the steps involved in Beer production. **[3]**

e) What is cephalosporine? Give its application. **[3]**

SECTION - II

Q5) **Answer the following questions:**

a) What are cytokinines? Give Roles. **[3]**

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

c) Describe media preparation and sterilization technique in tissue culture. **[5]**

Q6) **Write a short note on following:**

a) Cryopreservation **[4]**

b) Maintenance of fibroblast culture. **[4]**

c) Somaclonal variation & their importance. **[4]**

Q7) **Answer the following questions:**

a) Describe characteristics of primary cell culture and established cell line. **[4]**

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

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

i) Serum

ii) Tryptophan

iii) Insulin

iv) Biotin

Q8) **Attempt the following questions (any four):**

a) What are advantages of serum as constituent in culture media. **[3]**

b) Describe protoplast fusion. **[3]**

c) Define phytochemical? Give their importance. **[3]**

d) Give advantages of Natural media. **[3]**

e) Describe somatic cell hybridization. **[3]**

Total No. of Questions : 8]

PA-3235

[5910] - 34
M.Sc. (Semester - III)
BIOCHEMISTRY
BCH - 314 (B) : Pharmacology and Forensic Biochemistry
(2019 Pattern)

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.***
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SECTION - I

(Pharmacology)

Q1) **Attempt the following:**

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c) Define agonists and antagonists. What are the types of agonist drugs? **[4]**

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c) Adverse drug reaction.

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

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

a) What are the challenges in drug development?

b) Explain pharmakokinetics.

c) Explain sign, symptoms and treatments of adverse drug reactions.

P.T.O.

SECTION - II

(Forensic Biochemistry)

Q5) **Answer the following:**

a) How dermal irritation test is performed? **[3]**

b) Explain in detail Phase-II biotransformation reaction. **[4]**

c) Explain the enzymes involved in DNA finger printing. **[4]**

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

a) Cytochrome P-450 monooxygenase system.

b) Allergic reactions.

c) Idiosyncratic reactions.

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

a) Explain descriptive animal toxicity tests.

b) Explain local and systemic toxicity.

c) Write an account on mutagenecity.

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

a) Define the following

i) Acute lethality.

ii) Sub acute toxicity

iii) Sub chronic toxicity.

iv) Chronic toxicity

b) Write the applications of toxicology in forensic science.

c) Write the roles of enzymes in forensic biochemistry.

Total No. of Questions : 8]

SEAT No. :

PA-3236

[Total No. of Pages : 2

[5910]-41

S.Y. M.Sc.

BIOCHEMISTRY

BCH-411 : Neuro Chemistry & 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 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

(Neurochemistry)

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

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

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

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

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

a) Cytology of neuron. **[4]**

b) Sensory modalities. **[4]**

c) Long term memory. **[4]**

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

a) What are the fundamental differences between chemically gated & voltage gated channels. **[4]**

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

c) Describe in detail, the T.S. of spinal cord. **[4]**

P.T.O.

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

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

b) Explain the different components of cerebrum. **[3]**

c) What is blood brain barrier? Give its importance. **[3]**

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

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

SECTION-II

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

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

b) Discuss transport, metabolism of FSH. **[4]**

c) Discuss structure, transport, metabolism and regulation of triiodethyronine and thyroxine. **[4]**

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

a) Write a note on somatomedians. **[4]**

b) G. Protein. **[4]**

c) Cholera toxin. **[4]**

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

a) Describe the structure, role and metabolism of Vasopressin. **[4]**

b) What are biochemical effects and clinical manifestation of androgens. **[4]**

c) Give the details of mode of action of steroid hormones. **[4]**

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

a) Discuss role of growth hormone in carbohydrate metabolism. **[3]**

b) Discuss the role of NGF and endorffins. **[3]**

c) Discuss the disorders related to FSH and LH. **[3]**

d) What ar catecholomines? Explain their physiological feature. **[3]**

e) Discuss the pathophysiology of ACTH. **[3]**

Total No. of Questions :8]

SEAT No. :

PA-3237

[Total No. of Pages : 2

[5910]-42

M.Sc. (Part-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 on separate answer papers.***
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) ***Figure on eight side indicate full marks.***
4) ***Neat diagram is required wherever necessary.***

SECTION-I

(Medical Biochemistry)

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

i) Write the names of enzymes used to diagnose CHD.

ii) Define the term cancer.

iii) List the types of thalassemia's and mutation involved in it.

iv) Write about the structure of lysosome.

v) Write cansative agents of cancer.

b) How penicillin an antibiotics shows its action? explain in detail. **[3]**

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

a) Write the mechanism by which antifungal drugs works. **[6]**

b) Write a short account on sickle cell anemia explaining biochemistry and mutation. Involve. **[4]**

c) What are hysosomal storage disesases. **[2]**

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

a) Explain the cycle of maleria. **[4]**

b) Elaborate role of viruses in cancer. **[4]**

c) Write the names of antivral drugs. **[2]**

d) Write the functions of prostaglandins. **[2]**

P.T.O.

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

a) Describe the mode of action of analyesics. **[4]**

b) How bacterial resistance is develop explain in detail. **[4]**

c) Write the types of influence with mutation. **[2]**

d) How targents and plagues are formed in the diseases Alzhemer. **[2]**

SECTION-II

(Physiological Biochemistry)

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

i) Define the term bufter ?

ii) Write the function of mineral calcium and potassium. in the body.

iii) Define the term respiration.

iv) Write functions of liver.

v) Write functions of kidney.

b) Explain the functional unit of kidney nephron. **[3]**

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

a) Write extrinsic pathway of blood clotting. **[4]**

b) Define the term jaundice and its types. **[4]**

c) How carbohydrates are digested. **[4]**

Q7) Attempt the Following: **[12]**

a) Define the term vitamins! Write about its absorption. **[2]**

b) Explain Fibrionolysis. **[4]**

c) Write short note on metabolic acidosis. **[3]**

d) Write the blood test used to assess function of liver. **[3]**

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

a) How protein digestion and absorption occurs. **[4]**

b) List the various buffers used in the maintenance of body. **[4]**

c) How oxygen and carbon dioxide is transported in the blood. **[4]**

Total No. of Questions :8]

SEAT No. :

PA-3238

[Total No. of Pages : 2

[5910]-43

M.Sc. (Part-II)
BIO-CHEMISTRY
BCH 413 [B] : Clinical Nutrition and Food Technology
(2019 Pattern) (Semester-IV)

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

Instructions to the candidates:

1) ***Answers to the two sections should to be written is seperate answer books.***
2) ***Q1 and Q5 are compulsory.***
3) ***Attempt any two questions from Q2 to Q4 and any two questions from Q6 to Q8.***
4) ***Figure to right indicate full marks.***

SECTION-I (Clinical Nutrition)

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

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

b) What is food allergy? Give its causes. **[3]**

c) Explain the different metabolic adaptations occuzing during muscle exercise. **[5]**

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

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

b) Malnutrition and its effects. **[4]**

c) Food hobits & food fadism in India. **[4]**

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

a) What are inborn errors of metabolism? explain management of any two disorders. **[4]**

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

c) Give the different methods used for assessment of nutritional status. **[4]**

P.T.O.

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

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

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

c) Name different agencies and their role in supplimentary nutritional programmes. **[3]**

d) What are the different eating disorders? Give their ill effects. **[3]**

e) Give the causes, symptoms and treatmet for phenylketonozia. **[3]**

SECTION-II (Food Technology)

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

a) What is the importance of good laboratory practices. **[3]**

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

c) How will you manulsacture natural sweetners mention any two **[4**

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

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

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

c) Importance of single cell protein. **[4]**

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

a) What are Genetically modified foods? Give their important characteristics. **[4]**

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

c) Explain The role of enzymes used in analysis of alcohol in food. **[4]**

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

a) Define BIS, FPO and codex. **[3]**

b) What are food additives? Enlist their types. **[3]**

c) Give the importance of SOP's **[3]**

d) Explain any three taste flavorants. **[3]**

e) Explain mechanism of action of sorbic acid and sorbates in food preservation. **[3]**

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