Total No. of Questions : 10]

SEAT No. :

PC4154

[Total No. of Pages : 3

[6337]-1001R
M.Sc. -I
BIO - CHEMISTRY
CHB-501 MJ : Biomolecules (T)
(2023 Credit Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***Q1 and Q6 are compulsory. Carry 5 marks each.***
2) ***Attempt any three questions from Q. No. 2 to Q. No. 5.***
3) ***Attempt any three questions from Q No 7 to Q No 10.***
4) ***Use separate answer sheets for both sections.***
5) ***Figure to the right indicate full marks.***

SECTION - I

Q1) Answer the following. **[5]**

a) Write the structure of cyclic form of α-D-glucose.

b) Define the term Enantiomer give example.

c) List the coenzyme form of Niacin.

d) What are conjugated lipids give example?

e) Write the deficiency symptom of Vitamin C.

Q2) a) Answer the following two questions. **[6]**

i) Write short account on 'Rancidity'. **[3]**

ii) What are disaccharides? How they are formed? Give the structure and importance of sucrose. **[3]**

b) Answer the following two questions. **[4]**

i) Why water is called universal solvent? **[2]**

ii) Differentiate the fat soluble and water soluble vitamins with examples. **[2]**

Q3) Write short notes on the following five. **[10]**

a) Significance of phospholipids

b) Amino Sugar

c) Structure of water molecules

d) Reducing sugars

e) Monosaccharides.

P.T.O.

Q4) a) Answer the following. **[6]**

i) Write the short account on lipoproteins with their significances. **[3]**

ii) What are polysaccharides? How are they classify? Give structures and examples. **[3]**

b) Attempt the following. **[4]**

i) What are coenzymes? Elaborate the function of coenzyme giving one example of reaction. **[2]**

ii) What are fatty acids? How they are classify? **[2]**

Q5) Attempt the following questions. **[10]**

a) What are lipids? How they are classify? **[5]**

b) Describe the biochemical function and deficiency of riboflavin. **[5]**

SECTION - II

Q6) Answer the following questions. **[5]**

a) Write structure of Phenyl alanine.

b) What are the characteristics of peptide bond?

c) What is denaturation of proteins?

d) What are globwar proteins?

e) List non-essential amino acids.

Q7) a) Answer the following questions. **[6]**

i) Explain Ramchandran Plot. **[3]**

ii) Write short account on End-group analysis. **[3]**

b) Answer the following questions. **[4]**

i) How peptide bond is formed? **[2]**

ii) Write about the structure of myoglobin. **[2]**

Q8) Write short notes on the following. **[5×2=10]**

a) Rare amino acids.

b) Fibrous proteins

c) Zwitterion.

d) Branched chain amino acids.

e) Significance of electric pH.

Q9) a) Write the answers of following questions. **[6]**

i) Explain Ninhydrin reaction of amino acids. **[3]**

ii) Explain β pleated sheets with diagram. **[3]**

b) Answer the following questions. **[4]**

i) Write the structure of Glutamate and aspartate. **[2]**

ii) Write about biological significance of protein. **[2]**

Q10) Answer the following. **[10]**

a) With the structure of Glycine explain the titration curve and write its significances. **[5]**

b) Write short account on 'quaternary structure' of protein. **[5]**

■■■■

Total No. of Questions : 10]

SEAT No. : ____

PC4155

[Total No. of Pages : 3

[6337]-1002
M.Sc. - I
BIOCHEMISTRY
CHB-502 MJ : Enzymology and Biophysical Techniques
(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***Q.1 and Q.6 are compulsory and carry 5 marks.***
2) ***Attempt any three questions from Q.2 to Q.5.***
3) ***Attempt any three questions from Q.7 to Q.10.***
4) ***Answer to the both sections should be written in separate answer sheets.***
5) ***Figures to the right hand side indicate full marks.***

SECTION - I

(Engymology)

Q1) Answer any five of the following. **[5]**

a) What do you mean by apoenzyme and holoenzyme?

b) Give the significance of Km.

c) What is the effect of substrate concentration of enzyme activity?

d) What is transition state in enzyme catalysed reaction?

e) What type of reactions are catalysed by ligase enzyme in enzyme classification?

f) What is the turnover number of lysozyme enzyme?

Q2) Answer the following:

a) i) Explain covalent catalysis with example. **[3]**

ii) Explain Fischer's lock & key hypothesis. **[3]**

b) i) Explain what happens to MM. equation when S<<Km. **[2]**

ii) Explain double displacement method in enzyme catalysed reaction. **[2]**

P.T.O.

Q3) Write short notes on. (any five) **[10]**

a) Noncompetitive inhibition

b) Presteady state kinetics

c) Affinity label

d) Isoenzyme

e) K.N.F. model

f) Suicide inhibitors

Q4) Solve the following:

a) i) Comment on any two factors leading to rate enhancement of enzyme catalysed reaction. **[3]**

ii) What is side chain modification of amino acids. Explain with example. **[3]**

b) i) Give salient features of active site. **[2]**

ii) Enlist seven classes of enzymes with example. **[2]**

Q5) Attempt any two of the following. **[10]**

a) Give mechanism of enzyme degradation.

b) Discuss the mechanism of reaction catalysed by chymotrypsin.

c) Derive Lineweaver burk equation. How do you find Km of double reciprocal plot?

SECTION - II

(Biophysical Techniques)

Q6) Answer the following. (any five) **[5]**

a) Why is it necessary to purify enzymes?

b) What is a stationary phase in paper chromatography?

c) Which buffer is used in SDS-PAGE?

d) What is ion exchange resin in chromatography?

e) How is molecular weight determined by electrophoresis?

f) Why is ammonium per sulphate used in page?

Q7) Answer the following:

a) i) What is the difference between SDS and native page? **[3]**

ii) Why is protein precipitation important? **[3]**

b) i) Why is agarose used in gel electrophoresis instead of agar? **[2]**

ii) What type of detector is used in gas chromatography? **[2]**

Q8) Write short notes on. (any five) **[10]**

a) Diffraction grating of spectrophotometer

b) Nitrocellulose membrane

c) Hydrophobic interaction

d) Monochromator

e) Metal chelate chromatography

f) Paper electrophoresis

Q9) Solve the following:

a) i) How are proteins eluted in affinity chromatography? **[3]**

ii) Write the disadvantages of Ion exchange chromatography. **[3]**

b) i) Why are ampholytes used in isoelectric focusing? **[2]**

ii) What are the steps of extraction technique? **[2]**

Q10) Attempt any two of the following. **[10]**

a) Explain any two applications of disc electrophoresis.

b) Describe the method of purification by gel chromatography.

c) Discuss the components of HPLC.

Total No. of Questions : 5]

SEAT No. :

PC4156

[Total No. of Pages : 2

[6337]-1003

First Year M.Sc.

BIOCHEMISTRY

CHB - 503 - MJ : CELL BIOLOGY

(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***Question No. 1 is compulsory.***
2) ***Attempt any three questions from Q. 2. to Q. 5.***
3) ***Figures on right hand side indicate full marks.***

Q1) Attempt the following questions. (Any five) **[5]**

a) Write the function of Golgi-apparatus.

b) Define stem cell.

c) What is role of collagen?

d) Define the term organogenesis.

e) What is extracellular matrix?

f) What is the function of Peroxisomes?

Q2) a) Answer the following questions. **[6]**

i) With the help of diagram explain fungi cell structure.

ii) Draw a diagram of chloroplast and explain its functions.

b) Answer the following questions. **[4]**

i) Write about the function of xylem and phloem.

ii) What is yeast? Give its importants.

P.T.O.

Q3) Write short notes on following. **[10]**

a) Plasmodesmata.

b) Mitochondria structure and function.

c) Cell adhesion molecules.

d) Stains and Markers for nucleus.

e) Endoplasmic Reticulum [ER].

Q4) a) Answer the following questions. **[6]**

i) Explain with diagram the gap junction.

ii) Comment on Mitosis.

b) Answer the following questions. **[4]**

i) What is cytoskeleton? list it's components?

ii) What is cell differentiation?

Q5) Answer the following. (Any Two) **[10]**

a) With the help of diagram describe the process of meosis.

b) Explain how cyclins and cyclin dependent kinases control cell cycle.

c) Write short account on subcellular fractionation.

Total No. of Questions : 5]

SEAT No. :

PC4157

[Total No. of Pages : 2

[6337]-1004
M.Sc. (Part - I)
BIOCHEMISTRY
CHB-505-MJ : Microbiology
(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Attempt any two questions from Q.2 to Q.5.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following : **[5]**

a) Define autotrophs with example.

b) What is difference between disinfectant and sanitizer?

c) Define mutation and mutagen.

d) What are different types of antibodies?

e) Define mycoplasma.

f) What is the role of flagella?

Q2) a) Write short note on the following : **[6]**

i) Cell division in microorganism.

ii) Microbial production of glutamic acid.

b) Attempt the following : **[4]**

i) Describe the selection of auxotropic mutants.

ii) Explain diseases associated with microorganisms.

P.T.O.

Q3) Write short notes on the following (any 5) : **[10]**

a) Nitrogen fixation

b) Plant viruses

c) Pure culture

d) Moist heat sterilization

e) SEM

f) Bacteriological media

Q4) a) Answer the following : **[6]**

i) Classify bacteriophages based on their morphology.

ii) Differentiate between continuous culture and batch culture.

b) Attempt the following : **[4]**

i) Explain cell wall structure of Gram negative bacteria.

ii) Write the applications of fluorescent microscope.

Q5) Attempt any two of the following : **[10]**

a) Explain lysine production using microorganisms.

b) Explain the mechanism of action endotoxin with example.

c) Describe production of mutants by physical agent.

Total No. of Questions : 6]

SEAT No. :

PC4158

[Total No. of Pages : 2

[6337]-1006
First Year M.Sc.
BIOCHEMISTRY
CHB-508 MJ : Research Methodology
(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures on the right indicate full marks.***
3) ***There is no section. Calculators are allowed.***

Q1) Answer the following questions. **[5×2=10]**

a) Define Trade secrete.

b) List the safety equipments in Labs.

c) Write the use of Lab coat.

d) Why filteration is used in Laboratory.

e) Write the Mean of following Raw data.

21. 22, 25, 19, 17, 26, 23, 17, 11, 23.

Q2) Attempt the following questions any two. **[2×5=10]**

a) List the basic Rules for Laboratory work.

b) Find the median of the following data.

11, 10, 09, 13, 15.

c) Explain Autoclaving use for disinfection.

Q3) Write short notes on (any three) **[3×5=15]**

a) Major action taken during chemical spill.

b) Gas sterilization.

c) Respirator.

d) Eye and face protection.

P.T.O.

Q4) Answer the following questions. **[2×5=10]**

a) What is patent? Give importants and rights of patents.

b) Calculate the madian for frequency distribution using following date.

Marks	Frequency
0-10	05
10-20	10
20-30	20
30-40	12
40-50	08

Q5) Answer the following questions. **[3×5=15]**

a) Write application of Irradiation.

b) What is Intellectular property right (IPR)? List the tools of IPR.

c) What is Radiological spill? Explain use of 'SWIMS'.

Q6) Answer the following question. **[2×5=10]**

a) Write short account on 'Plagiarism'.

b) Find A.M. (Arithmatic mean) for the following frequency distribution.

Class	F
0-10	02
10-20	05
20-30	20
30-40	03
40-50	02

■■■■

Total No. of Questions : 10]

SEAT No. :

PC4159

[Total No. of Pages : 3

[6337]-2001
M.Sc. - I
BIOCHEMISTRY
CHB-551MJ : Bioenergetics and Metabolism
(Credit 2023 Pattern) (Semester-II)

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

Instructions to the candidates:

1) ***Question 1 and Q.6 are compulsory.***
2) ***Attempt any three questions from question 2 to question 5.***
3) ***Attempt any three questions from question 7 to question 10.***
4) ***Answers of both sections should be written on separate answer sheet.***
5) ***Figures to the right indicate full marks.***

SECTION-I

Q1) Answer the following. **[5]**

a) List the energy rich compounds of our body.

b) What are ketone bodies.

c) Write the glyoxylate cycle significance.

d) Define the term oxidative phosphorylation.

e) List out the Gluconergenic precursor of our body.

Q2) a) Answer the following: **[6]**

i) Write the role of enzymes and coenzymes involved in the conversion of pyruvate to acetyl-coA.

ii) Explain with the help of diagram Electron Transport Chain (ETC).

b) Answer the following questions: **[4]**

i) Write the significance of pentose phosphate pathway.

ii) Write short account on glycogen degrodation to release on sugar molecule.

P.T.O.

Q3) Write short account/notes on the following. **[5×2=10]**

a) ATP synthase complex.

b) Types of fatty and oxidation

c) Substrate level phosphorylation

d) Fatty acid synthase complex

e) Anapleurotic reactions of TCA cycle.

Q4) a) Answer the following questions. **[6]**

i) How Glycolysis is regulated?

ii) Why TCA is called Amphobolic in nature?

b) Attempt the following. **[4]**

i) Explain carnithine shuttle.

ii) Write about inborn error of carbohydrate metabolism.

Q5) Attempt the following questions. **[10]**

a) Explain β oxidation of palmitic acid with energetics.

b) Write in details with every step how many molecules of ATP are generated after oxidation of one glucose molecule.

SECTION-II

Q6) Answer the following questions. **[5]**

a) Write the fate of amino acids in the body.

b) Write the Energetics of urea cycle.

c) What is the significance of Gama-Gutamyl cycle.

d) Write the significance of purine synthesis.

e) What is the importance of Gutathione in the body.

Q7) a) Answer the following questions. **[6]**

i) How urea cycle is regulated?

ii) Write short account on purine salvage pathway.

b) Answer the following questions, conversions.

i) dump $\rightarrow$ dTMP **[2]**

ii) Tyrosine $\rightarrow$ Epinephrine **[2]**

Q8) Write short notes on the following. **[5×2=10]**

a) Maple syrup urine disease

b) Proteolysis

c) Regulation of pyrimidine synthesis

d) Gout

e) Difference between salvage & de-nova pathway

Q9) a) Answer the following. **[6]**

i) Describe the role of Tetra-Hydro-biopterin in the synthesis of phenyl alanine $\rightarrow$ Tyrosine.

ii) Explain regulation of purine biosynthesis.

b) Write the following conversations.

i) UMP $\rightarrow$ UTP **[2]**

ii) IMP $\rightarrow$ AMP **[2]**

Q10) Attempt the following questions. **[10]**

a) Explain urea cycle

b) Explain the synthesis of deoxyribonucleotide

Total No. of Questions : 10]

SEAT No. : ____

PC4160

[Total No. of Pages : 3

[6337]-2002

M.Sc. (Part - I)

BIOCHEMISTRY

CHB-552-MJ : Membrane Biochemistry and Genetics

(2023 Credit Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Q.1 and Q.6 are compulsory and carry 5 marks.***
2) ***Attempt any three questions from Q.2 to Q.5.***
3) ***Attempt any three questions from Q.7 to Q.10.***
4) ***Answers to both sections should be written on separate answer sheets.***
5) ***Figures to the right hand side indicate full marks.***

SECTION - I

(Membrane Biochemistry)

Q1) Answer any five of the following : **[5]**

a) Explain the term hyperpolarization.

b) Define endocytosis.

c) What is symport?

d) What is the role of phospholipid translocase in membrane transport?

e) Give example of secondary active transport.

f) Give the role of lipid Rafts.

Q2) Attempt the following questions.

a) i) Explain the functioning of ligand gated channel. **[3]**

ii) Discuss the cell components of plasma membrane and give their function. **[3]**

b) i) What happens to the blood cells when suspended in isotonic and hypertonic solutions? **[2]**

ii) State different types of transport of molecules across membrane. **[2]**

P.T.O.

Q3) Write short notes on any five of the following **[10]**

a) Integral proteins

b) Ion channel

c) Davson - Danielle Model

d) Factors affecting membrane permeability

e) FRAP Technique

f) Osmoregulation

Q4) Answer the following questions.

a) i) Discuss Active transport of sodium and potassium ions. **[3]**

ii) Discuss the specialized mechanism of transport of macromolecules. **[3]**

b) i) Give the difference between uniport and antiport with example. **[2]**

ii) Comment on the role of cholesterd in membrane structure. **[2]**

Q5) Attempt any two of the following : **[10]**

a) Discuss facilitated diffusion and its types.

b) Explain mechanism of action of ionophores and their significance in a cell.

c) Explain the Mechanism of ATP-ADP translocase and its importance.

SECTION - II

(Genetics)

Q6) Answer any five of the following : **[5]**

a) Define genotype and phenotype.

b) Draw a well labelled diagram of double helical DNA.

c) Define cosmids.

d) Write the degenracy of codon with example.

e) Define mutation and mutagen.

f) Explain human teratogenesis.

Q7) a) Answer the following : **[6]**

i) Explain semiconservative mechanism of DNA replication.

ii) Explain complementation test and co-linearity.

b) Attempt the following : **[4]**

i) What are vectors? Enlist the properties of good vector.

ii) Explain framshift mutation.

Q8) Write a short note on any five of the following **[10]**

a) Genetic code

b) Transduction

c) PBR322

d) Turner syndrome

e) Nearest neighbor analysis

f) Genetics

Q9) a) Answer the following : **[6]**

i) What is point mutation. Explain one example.

ii) Explain positive regulation of lac operon.

b) Attempt the following : **[4]**

i) Elaborate denaturation of DNA.

ii) Explain the experiment performed by Frederick Griffith.

Q10) Attempt any two of the following : **[10]**

a) Describe the following terms.

i) Monohybrid

ii) Dihybrid

iii) Homozygous

iv) Heterozygous

v) Dominance & Recessive

b) Explain the concept of gene by Benzer.

c) Explain λ phage as vector.

Total No. of Questions : 5]

SEAT No. : [ ]

PC4161

[Total No. of Pages : 2

[6337]-2003

First Year M.Sc.

BIOCHEMISTRY

CHB - 553 - MJ : Techniques in Characterization of Biomolecules

(Credit 2023 Pattern) (Semester - II)

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

1) Question 1 is compulsory.

2) Attempt any three questions from Q.2 to Q.5.

3) Figures on right hand side indicate marks.

Q1) Attempt the following questions. **[5]**

a) What is diffusion coefficient?

b) Write any two applications of x-ray diffraction.

c) List two advantages of LCMS.

d) What is viscosity?

e) Write the principle of zonal centrifugation.

Q2) a) Answer the following questions. **[6]**

i) Explain any one application of ORD & CD.

ii) What is band sedimentation?

b) Attempt the following questions. **[4]**

i) Write the mobile phases used in LCMS.

ii) What is polarization of fluorescence.

P.T.O.

Q3) Write short notes on the following. **[5×2=10]**

a) Ostwalds capillary viscometer.

b) Factors affecting sedimentation.

c) Principle of NMR.

d) Application of GCMS.

e) Ramchandran plot.

Q4) a) Attempt following questions. **[6]**

i) Explain the partial specifie volume.

ii) What is polarization of fluoroscence?

b) Answer the following questions. **[4]**

i) List the factors affecting sedimentation.

ii) What is sedimentation velocity.

Q5) Answer the following questions. **[10]**

a) Discuss the equipments used in circular Dichroism (CD). **[5]**

b) Explain stripping method of autoradiography. **[5]**

Total No. of Questions : 5]

SEAT No. : [ ]

PC4162

[Total No. of Pages : 2

[6337]-2004

First Year M.Sc.

BIOCHEMISTRY

CHB-560-MJ : Bioinformatics

(2023 Credit Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Questions 1 is compulsory.***
2) ***Attempt any 3 questions from Q.2 to Q.5.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following question (any 5) **[5]**

a) Describe one method for visualizing protein structures.

b) How does the PDB categorize protein structures?

c) What is the purpose of the uni parc database?

d) Explain Scopus.

e) Mention one RNA Sequence databases.

f) What is phylogentic analysis?

Q2) a) Answer the following questions : **[6]**

i) Describe any major DNA sequence databases.

ii) Explain the concept of impact factor and its significance in scientific publishing.

b) Answer the following question. **[4]**

i) Explain DDBJ database.

ii) Define pair - wise sequence alignment.

P.T.O.

Q3) Write a short note (any 5) **[10]**

a) PDB

b) Multiple sequence alignment

c) NCBI

d) i 10 - index

e) Next Prot

f) Gen Pept

Q4) a) Answer the following questions : **[6]**

i) Provide an overview of the resources available at the European Bioinformatics Institute (EBI).

ii) Describe the process of constructing a phylogenetic tree and interpreting its results.

b) Answer the following questions. **[4]**

i) Explain PubMed.

ii) Explain any file format used in bioinformatic.

Q5) Answer the following questions : **[10]**

a) Describe the process of conducting a scientific literature search using Pubmed, scopus and Google scholar.

b) Comment on impact factor and h-index in assessing the quality and significance of scientific research.

c) Give importance of bioinformatics in drug discovery.

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Total No. of Questions : 7]

SEAT No. :

PC4163

[Total No. of Pages : 2

[6337]-3001
S.Y.M.Sc.
BIO CHEMISTRY
CHB-601 MJ : Molecular Biology
(2023 Credit Pattern) (Semester-III)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***There is no section.***

Q1) Answer in short (any 5): **[10]**

a) What is Replication?

b) Give the function of DNA polymerase I.

c) Differentiate between Prokaryotic and Eukaryotic promoters.

d) What is the role of ribosomes in Translation?

e) Give the significance of signal recognition particle.

f) What is the function of mRNA in Translation?

g) What is protein Trafficking?

Q2) a) Answer any 2 of the following: **[6]**

i) Explain the mechanism of protein degradation.

ii) Describe the pathway taken by protein destined for lysosomes.

iii) Name any three key enzymes involved in DNA synthesis and describe their function.

b) What is replication fork? What are the key processes occuring at this site? **[4]**

Q3) a) Answer any 2 of the following: **[6]**

i) How proteins are transported from ER to golgi?

ii) Describe the inhibitors of translation in Eukaryotes.

iii) What is Ames test? How it is used to detect mutagenic potential?

b) Describe in detail the functions of Rec A, Rec B, Rec C and Rec D in genetic recombination. **[4]**

P.T.O.

Q4) a) Answer any 2 of the following: **[6]**

i) Write a short note on Genome protection.

ii) Explain in detail about CRISPR-Cas 9.

iii) What is the role of Holiday structure in genetic recombination?

b) Describe the structure of chromatin and its role in gene expression. **[4]**

Q5) a) Answer any 2 of the following: **[6]**

i) Write a short note on RNAi.

ii) Explain SOS response in Bacteria.

iii) Describe the structure of tRNA. What are codons and anticodons.

b) What is signal hypothesis? How does it relate to intracellular protein targetting? **[4]**

Q6) a) Answer any 2 of the following: **[6]**

i) Describe the structure of ribosomes in Eukaryotes and explain ribosomal sites for protein synthesis.

ii) Write the significance of RNA.

iii) What are spliceosome? Explain in detail.

b) Describe post transcriptional modification of mRNA. **[4]**

Q7) Answer any 4 of the following: **[10]**

a) Enlist stop codons and give its role.

b) Explain the role of EF-Tu in E.coli during Translation.

c) What is the significance of s'capping and z' polyadenylation in mRNA?

d) What is a ribozyme, and how does it function as catalytic RNA?

e) Enlist the common types of DNA damages.

■■■■

Total No. of Questions : 10]

SEAT No. : ____

PC4164

[Total No. of Pages : 3

[6337]-3002
S.Y. M.Sc.
BIOCHEMISTRY
CHB-602 MJ : Medical Biochemistry and Immunology
(2023 Credit Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Q. No. 1 and Q. No. 6 are compulsory.***
2) ***Attempt any three questions from Q.2 to Q.5.***
3) ***Attempt any three questions from Q.7 to Q.10.***
4) ***Use separate answer sheet for both section.***
5) ***Figures to the right indicate full marks.***

SECTION - I

(Medical Biochemistry)

Q1) Answer the following questions. **[5]**

a) What is point mutation?

b) List the lysosomal enzymes.

c) List the enzymes studied in myocardial infraction.

d) Define the term pinocytosis.

e) Write significances of apoptosis.

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

i) Explain the mechanism of antibiotic that inhibit 50s ribosomal unit with diagram.

ii) How ‘macrolides’ work against infection?

b) Attempt the following. **[4]**

i) Define the term protooncogens and oncogenes.

ii) List the agents involved in cancer, as a causative agents.

P.T.O.

Q3) Attempt the following short notes. **[10]**

a) Phagocytosis

b) Sickle cell anemia

c) Lysosomal storage diseases

d) Sulfonamides and their action

e) Hallucinogens

Q4) a) Attempt the following questions. **[6]**

i) Explain mode of action of 'folate antagonist'.

ii) Write short account on Thalassemia.

b) Answer the following questions. **[4]**

i) What are caspuses?

ii) What is the structural characteristic of lysosomal membrane?

Q5) Attempt the following questions (Any Two). **[10]**

a) Discuss various Mechanisms of 'antibiotic resistance' with examples.

b) How penicillin work as a cell wall synthesis inhibitor?

c) What are azoles? Discuss mechanism of action as antifungal drug.

SECTION - II
(Immunology)

Q6) Answer the following questions. **[5×1=5]**

a) List any two advantages of Western blotting.

b) What are cytokines?

c) What are Interferone?

d) What is passive Immunity?

e) Write the principle of RIA (Radio Immuno Assay).

Q7) a) Answer the following questions. **[6]**

i) Explain Type II Hypersensitivity reaction.

ii) Discuss the antigen presentation and processing of cytosolic pathway.

b) Attempt following questions. **[4]**

i) Write principle of ImmunoElectrophoresis.

ii) What is spleen?

Q8) Write short notes on the following. **[5×2=10]**

a) Blood group substances.

b) Autoimmune diseases.

c) Monoclonal antibody production.

d) Toll like Receptors. (TLR's)

e) Anatomical barrier in Innate Immune responses.

Q9) a) Answer the following questions. **[6]**

i) What are the types of T cell? Write function of each cell type.

ii) What is Haematopoiesis? Elaborate your answer with diagram.

b) Answer the following questions. **[4]**

i) Discuss the types of Immunodiffusion.

ii) Why booster dose of polio vaccine is require?

Q10) Attempt the following questions (Any Two). **[10]**

a) What is ELISA? Discuss various types using diagrams.

b) Discuss the structure of MHC I molecule and write in short about antigen presentation by Endocytic pathway.

c) Discuss cell mediated Immune response with the help of diagrams.

Total No. of Questions : 5]

SEAT No. :

PC4165

[Total No. of Pages : 2

[6337]-3003

S.Y.M.Sc.

BIO - CHEMISTRY

CHB - 603 MJ : Biochemistry of Specialized Tissues

(2023 Credit Pattern) (Semester - III)

Time : 2 Hours] [Max. Marks : 35

Instructions to the candidates:

1) *Q. 1. is compulsory and carries 5 marks.*
2) *Attempt any three questions from Q. 2. to Q. 5.*
3) *Figures to the right indicate full marks.*

Q1) Answer the following. (Any five) **[5]**

a) What do you mean by cell motility?

b) Which protein binds ATP during contraction?

c) What is rhodopsin and where is it found?

d) How do neurotoxins affect the synapse?

e) What role do taste receptor cells play in taste sensation?

f) What are the main types of touch receptors in human skin?

Q2) a) Answer the following questions.

i) Explain the sliding filament theory of muscle contraction. **[3]**

ii) Describe the role of G-proteins in olfactory signaling. **[3]**

b) i) Explain the function of the sarcoplasmic reticulum in muscle cells. **[2]**

ii) Describe the structure of a skeletal muscle cell. **[2]**

P.T.O.

Q3) Write short notes on. (any five) **[10]**

a) Visual excitation.

b) Cyclic GMP in the phototransduction pathway.

c) Olfactory receptor.

d) Sensation of touch.

e) Olfactory signal transduction.

f) Taste buds.

Q4) Solve the following.

a) i) Describe the role of creatine phosphate in muscle metabolism. **[3]**

ii) What is the significance of myelin in nerve conduction? **[3]**

b) i) What is a sarcomere and why is it important? **[2]**

ii) How does potassium enter neurons? **[2]**

Q5) Attempt any two of the following. **[10]**

a) Describe the generation and propagation of action potentials in detail, including the roles of voltage-gated ion channels.

b) Discuss the ultrastructural organization of skeletal muscle, including the arragement of myofibrils and the role of the sarcoplasmic reticulum.

c) Describe the structure and function of rhodopsin.

Total No. of Questions : 5]

SEAT No. : ____

PC4166

[Total No. of Pages : 2

[6337]-3004

S.Y.M.Sc.

BIOCHEMISTRY

CHB-610 MJ: Toxicology

(2023 Credit Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Q. No.1 is compulsory.***
2) ***Solve any three questions from Q. No.2 to Q. No.5.***
3) ***Figures on right hand side indicate marks.***

Q1) Answer the following questions. **[5]**

a) What is clinical Toxicology?

b) Define narcotics?

c) List neurotic poisions.

d) What are Hallucinoges.

e) Define the term Idiosyncratic reactions.

Q2) a) Answer the following questions. **[6]**

i) Give the characteristics of cytochrome P450 complex.

ii) Enlist the route and site of exposure of toxic agents.

b) Answer the following questions. **[4]**

i) What are the medico-legal aspects of poisons?

ii) Define the term Tolerance with types.

Q3) Write short note on the following. **[10]**

a) Metallic poison.

b) Selective Toxicity.

c) Psychotropic substances & its uses.

d) Diagnosis of poison in dead.

e) Cardiac poisons.

P.T.O.

Q4) a) Attempt the following questions. **[6]**

i) What are corrosive poisons? Write the classification with examples.

ii) What is local verses systemic toxicity?

b) Attempt the following questions. **[4]**

i) Write short on General Toxicity.

ii) Write significances fo Detoxication Reactions.

Q5) Answer the following questions. **[10]**

a) Explain phase I & phase II reactions of biotransformation.

b) What is antidotes. Explain its types with examples and significances.

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Total No. of Questions : 5]

SEAT No. :

PC4167

[Total No. of Pages : 2

[6337]-3005
S.Y.M.Sc.
BIOCHEMISTRY
CHB-611-MJ : Physiological Biochemistry
(2023 Credit Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Q.1 is Compulsory.***
2) ***Attempt any three questions from Q.No.2 to Q.No.5***
3) ***Figures to the right indicate full marks.***

Q1) Attempt the following Questions. **[5]**

a) Write the function of mineral, calcium and potassium.

b) Write functions of liver.

c) Write functions of kidney.

d) Define the term Anemia.

e) List the pathological/diseases conditions of liver.

Q2) a) Answer the following questions. **[6]**

i) What is Jaundice? Explain Types of Jaundice in detail.

ii) Write about Intrinsic pathway of blood coagulation

b) Attempt the following questions. **[4]**

i) How carbohydrates are digested?

ii) Define Respiratory alkalosis.

P.T.O.

Q3) Write short notes on the following. **[5×2=10]**

a) Respiratory acidosis

b) Fibrinolysis

c) Transport and absorption of digested carbohydrates.

d) Polycythemia.

e) Diagnostic test of liver function (LFT).

Q4) a) Answer the following Questions. **[6]**

i) Write about Extrinsic pathway.

ii) 'Digestion and absorption of protein' write short account.

b) Answer the following. **[4]**

i) Absorption of vitamin, write short account

ii) Transport of CO_2

Q5) Attempt the following questions. (any two) **[2×5=10]**

a) What is nephron? Explain with the help of diagram.

b) Explain the formation of urine

c) How oxygen (O_2) is transported in the body. Explain using diagram.

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Total No. of Questions : 5]

SEAT No. :

PC4168

[Total No. of Pages : 2

[6337]-3006
S.Y. M.Sc.
BIOCHEMISTRY
CHB-612-MJ : Applied Plant Biochemistry
(2023 Credit Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Q.1 is compulsory and carry 5 marks.***
2) ***Attempt any two questions from Q.2 to Q.5.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following (Any 5) : **[5]**

a) Give role of Mg in plants.

b) Define photosynthesis.

c) Name any two N_2 fixing bacteria.

d) Give any two applications of rubber.

e) Give names of synthetic Auxin (any two).

f) Give accessory pigments involved in photosynthesis.

Q2) Answer the following :

a) i) Explain the process of sulphur assimilation. **[3]**

ii) Explain the working of nitrogenase. **[3]**

b) i) Write a note on flavonoids. **[2]**

ii) Why Green house technique in forming yields more? **[2]**

P.T.O.

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

a) Nitrogen cycle

b) CAM pathway

c) Senescence

d) Cytokinin

e) Plant growth hormone

f) Gibberellin

Q4) Solve the following :

a) i) Enlist some hydroponic systems. **[3]**

ii) Give role of Auxin in Apical dominance. **[3]**

b) i) Give any two applications of secondary metabolites. **[2]**

ii) What is parthenocarpy? **[2]**

Q5) Attempt any two of the following : **[10]**

a) What are photosystems. Describe cyclic photophosphorylation.

b) Discuss phytoremediation with any one example.

c) Draw the structure of chloroplast and indicate the location of dark and light reaction.