

PGIS-N 1057 B-14
M.Sc. Ist Semester Degree Examination
Biochemistry
(Analytical Biochemistry and Biostatistics)
Paper - HCT-1.1
(New)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

Answer Q.No 1 and any four of the remaining

Part-A

1. Answer the following (10x2=20)
- a) What is sedimentation coefficient?
 - b) Define the units of radioactivity
 - c) Distinguish between the absorption and emission spectra
 - d) What are ampholytes? Mention their applications?
 - e) Write the principle of liquid scintillation counter?
 - f) What is the principle of column chromatography?
 - g) Mention different staining reagents used for identification of carbohydrates on TLC
 - h) What is standard error? How is it determined?
 - i) Write the principle and applications of isoelectric focusing?
 - j) What is a percent bar diagram?

2.
 - a) Describe the fractionation of cell components by differential centrifugation
 - b) Explain the process of separation of proteins by gel permeation chromatography
 - c) Explain the significance of double isotope dilution method (5x3=15)

3.
 - a) Write an account of range of ion exchange materials used for ion exchange chromatography
 - b) Discuss the principle and applications of 2-D gel electrophoresis.
 - c) Describe the principle and applications of gel permeation chromatography. (5x3=15)

4.
 - a) Explain the principle of UV-Visible spectrometry with flow diagram.
 - b) Write a note on rotors used in centrifugal analysis. Add a note on care of rotors.
 - c) What is ORD? Give the principles and applications of the same. (5x3=15)

5.
 - a) Describe the principle, instrumentation and applications of fluorescence spectrophotometry.
 - b) Give the schematic representation of HPLC system. Mention different types of detectors used in it.
 - c) What is isoelectric point? How it can be used for protein purification (5x3=15)

6.
 - a) The following are the weights of children born in hospitals: 2.8, 3.2, 2.0, 2.9, 3.6, 3.3 and 1.9 kgs. calculate mean, median and mode for the data.
 - b) Explain isotopic dilution technique. Give its applications in biological studies.
 - c) Define standard error. compute standard deviation for the following data on lipase of ten samples: 5.0, 8.5, 6.8, 4.0, 7.5, 9.0, 3.0, 10.0, 8.0, 7.0 (5x3=15)

7. Write short notes on any **three** of the following

(3x5=15)

- a) Methods for representation of experimental data
 - b) Scintillation counter
 - c) Capillary electrophoresis
 - d) FPLC
-

PGIS N - 1063 B- 14
M.Sc. Ist Semester (CBCS) Degree Examination
Biochemistry
(Microbiology)
Paper : SCT 1.1
(New)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

*Answer question No. 1 and any **FOUR** of the remaining.*

1. Answer the following: **(10 × 2 = 20)**
 - a) Give the principle and applications of bright field microscopy.
 - b) How is acid fast staining performed? Classify bacteria based on this technique.
 - c) Differentiate between Archae and Eubacteria
 - d) Outline the bacterial classification based on number of flagella with an example each.
 - e) What are Prions? Name diseases caused by them.
 - f) Enlist various food born diseases. name microorganisms causing such diseases.
 - g) What are the bacterial endospores? Give two examples.
 - h) Write morphological features of Actinomycetes.
 - i) What is synchronous growth?
 - j) How does water influences growth of bacteria?
2.
 - a) Discuss bacterial classification based on morphological features
 - b) Describe phylogeny of *Achae*. Add a note on extremely *Halophilic bacteria*. **(7+8=15)**
3.
 - a) Discuss differences between Gram positive and negative bacterial cell wall. How is Gram staining performed in laboratory?
 - b) Discuss various methods used to isolate and maintain a pure bacterial culture. **(8+7=15)**
4.
 - a) Describe the different methods used to enumerate the bacterial.
 - b) Depict bacterial growth curve with various events occurring at each phase. **(7+8=15)**
5.
 - a) Outline classification of animal viruses. Add a note on plaque assay.

- b) What are viroids? How do they differ from that of viruses and prions? (8+6=15)
6. a) Discuss toxins produced by microorganisms. Add a note on mechanism of action of any one of them.
- b) What is chemotherapy? Explain with suitable examples.
- c) Give an account on biocontrol of crop diseases. (6+5+4=15)
7. Write notes on any three of the following:
- a) Mechanism of bacterial motility.
- b) Chemostat.
- c) Biogeochemistry
- d) TEM. (3 × 5 = 15)
-

PGIS N 1059 B-14
M.Sc. Ist Semester(CBCS) Degree Examination
Biochemistry
(Biomolecules)
Paper : HCT 1.2
(New)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

*Answer question No. 1 and any **FOUR** of the remaining.*

1. Answer the following: (10 × 2 = 20)
 - a) What are the structural differences between maltose and cellobiose?
 - b) What is mutarotation?
 - c) Write the structures of N-acetyl muramic acid and N-acetylglucosamine.
 - d) Give the structure of cholesterol and mention its biological functions.
 - e) Write the structures of dATP and mention its biological significance.
 - f) What are the salient features of peptide bond?
 - g) What is Bohr effect?
 - h) What are phytosterols? Give an example.
 - i) What will be the consequences of 'D' amino acids in the protein diet?
 - j) Define T_m and Cot values of DNA.
2.
 - a) Discuss the importance of buffers in biological systems.
 - b) Describe the structure of bacterial cell wall.
 - c) Derive the Henderson - Hessebalch equation. (5+5+5=15)
3.
 - a) Give the classification of carbohydrates with example.
 - b) Explain acid - base properties of amino acids.
 - c) Give the properties and importance of starch and cellulose. (5+5+5=15)

4. a) Give the composition of sphingolipids.
b) Discuss the determination of primary structure of protein. (7+8=15)
5. a) Discuss the structure of myoglobin.
b) Discuss about abnormal haemoglobins.
c) Discuss chemical synthesis of nucleic acids. (5+4+6=15)
6. a) Discuss the different models of DNA molecules.
b) Discuss the functional diversity of proteins. (7+8=15)
7. Write notes on any **three** of the following: (3 × 5 = 15)
- a) Ramachandran plot.
b) Peptide synthesis.
c) Protein folding.
d) DNA sequencing.
-

PGIS-N 1061 B- 14
M.Sc. Ist Semester(CBCS)Degree Examination
Biochemistry
Enzymology
Paper : HCT 1.3
(New)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

Answer question No. 1 and any FOUR of the remaining.

1. Answer the following: (10 × 2 = 20)
- a) What are the characteristic properties of enzymes?
 - b) What is salting in? How is it helpful in precipitation of an enzyme?
 - c) Define the terms K_m and V_{max} . Write their significance.
 - d) What is coupled enzyme assay? Give an example.
 - e) Write the effect of pH on the activity of an enzyme.
 - f) What is acid base catalysis? Give an example.
 - g) What are the advantages of multienzyme complexes?
 - h) Give the coenzymic functions of flavin nucleotides.
 - i) What are isoenzymes? Give an example.
 - j) How are soluble enzymes stabilized?
2. a) Give the IUB classification of enzymes with suitable examples.
b) Explain the methods available for disruption of cellular mass.
c) Describe the technique used for establishment of purity of enzyme. (5+5+5=15)
3. a) Discuss any two methods used for assay of enzymes with an example.
b) Give the rate expression for a single substrate enzyme catalyzed reaction based on equilibrium assumption.
c) Write a note on reversible enzyme in inhibition. (5+5+5=15)

4. a) Discuss the different methods used for identification of active site of an enzyme.
b) Describe the different types of mechanisms involved in bisubstrate enzyme reactions. (7+8=15)
5. a) Discuss the 3 - Dimensional features of lysozyme as revealed by X-ray analysis.
b) Explain the mechanism of action of RNase.
c) Give an account of chymotrypsinogen activation. (5+6+4=15)
6. a) Describe the regulation of activity of ATCase.
b) Discuss the regulation of enzyme activity by feedback inhibition.
c) Discuss the regulation of enzyme activity by reversible covalent modifications. (6+4+5=15)
7. Write notes on any **three** of the following: (3 × 5 = 15)
- a) Industrial application of enzymes.
b) Rapid reaction techniques.
c) Coenzymic functions of PLP.
d) Pyruvate dehydrogenase complex.
-