PGIS-N 1057 B-2K13

M.Sc. Ist Semester (CBCS) Degree Examination
Biochemistry
(Analytical Biochemistry & Biostatistics)
Paper - HCT- 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.

   a) What are the advantages of cellulose acetate over cellulose paper for electro phoresis?

   b) Define 'rpm' and 'g'.

   c) What are affinity ligands? Give an example.

   d) What is isotacho phoresis?

   e) State Beer - Lamberts Law.

   f) What is reverse phase chromatography?

   g) Mention the units for radioactivities.

   h) Write the applications of ORD and CD.

   i) What is 'secondary data? Give an example.

   j) Define 'range' and 'coefficient of range.   (10×2=20)

2. a) Discuss the principle and applications of 2-D paper chromatography.

   b) Write the principle and applications of HPLC.

   c) Discuss the adsorption chromatography.   (3×5=15)

3. a) Discuss the principle and applications of SDS - PAGE.   (8+7=15)

   b) Discuss the principle and applications of preparative high voltage electrophoresis.

4. a) Discuss types and uses of centrifuges.

   b) Discuss the principle and applications of autoradiography.   (8+7=15)

5. a) Discuss the principle and applications of infrared spectroscopy.

   b) Discuss the principle and applications of fluorescence spectroscopy.

   c) Discuss the principle and applications of density gradient centrifugation. **(3×5=15)**

6. a) Discuss types of 'correlation' giving suitable examples.

   b) Represent the following data in x percentage bar diagram.

   Table: content of water, carbohydrate protein and fat of two vegetables.

Vegetable	Water	Carbohydrate	Protein	Fat
Palak	26	2	1.5	0.5
Tomato	17	4	3.0	1.0

   c) Represent the following data in Pie diagram. **(3×5=15)**

   Table: yield of food grain.

Grain	yield (metric tonns)
Wheat	600
Rice	1000
Jowar	200

7. Write notes on any **three** of the following. **(3×5=15)**

   a) Gel permeation chromate graphy

   b) Measurement of Radioactivity.

   c) Mass spectroscopy.

   d) Students 't' test.

PGIS-O 1058 B-2K13

M.Sc. Ist Semester(Non-CBCS) Degree Examination
Biochemistry
(Biochemical Techniques & Computers)
Paper - 1.1
(Old)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

Answer quesiton *No.1* & any *four* of the remaining.

1. Answer the following:- (10×2=20)

   a) What are affinity ligands? Give an example.

   b) What is overlay spectra?

   c) What is moving boundary electrophoresis?

   d) Define equilibrium dialysis?

   e) Mention any two radio isotopes used in medical field.

   f) State Beer-Lambert's Law and its limitations.

   g) What are the applications of GLC?

   h) Mention any two computer softwares.

   i) What is LOTUS?

   j) Give the principle of reverse phase chromatography

2. a) Discuss the principle and applications of paper chromatography

   b) Discuss the principle and applications of affinity chromatography. (8+7=15)

3. a) Discuss the ion-exchange chromatography of proteins.

b) Write the principle and applications of polyacrylamide gel electrophoresis.(7+8=15)

4. a) Discuss the principle and applications of IR spectroscopy

   b) Discuss the principle and applications of density gradient centrifugation. **(8+7=15)**

5. a) Discuss the measurement of radioactive isotopes by liquid scintillation counter.

   b) Discuss the isotachophoresis of macromolecules. **(8+7=15)**

6. a) Discuss the applications of computers in Life sciences.

   b) Discuss the principle and applications of autoradiography **(7+8=15)**

7. Write notes on any **three** of the following **(3×5=15)**

   a) Radio hazards

   b) ORD

   c) MS-Office

   d) Ultra filtration

PGIS-N 1071 B-2K13

M.Sc Ist Semester Degree Examination
Biotechnology
(Bioanalytical Techniques)
Paper -SCT-1.1
(New)

Time : 3 Hours   Maximum Marks : 80

Instructions to condidates:

1.   Section A has all **compulsory** questions.

2   .Answer **B** and **C** sections as per instructions.

Section - A

Answer the following in brief.   (10x2=20)

1)   Zymograms

2)   Dialysis

3)   Flash evaporation

4)   RCF

5)   Circular Dichroism

6)   Isoelectro focussing

7)   IR

8)   Transilluminator

9)   Donnan effect

10) Confocal Microscopy

Section - B

Answer any **four** of the following   (4x6=24)

11. Liquid santillation counter

12. X-ray crystallography

13   Cerenkov radiation

14. Fluorescence Microscopy

15. Capillary electrophoresis

16. Cell disruption

Section - C

Answer any **three** of the following   (3x12=36)

17. Discuss in detail the theory and application of polyacrylamide gel electrophoresis.

18. Write an detailed account on MALDI - TOF and add a note on its significance

19   Give an account of column chromatography. Add a note on Reverse phase chromatography.

20. Write an account on the technique involved in cell immobilization.

PGIS-N 1067B-2K13

M.Sc Ist Semester (CBCS) Degree Examination
Biotechnology
(Cell and Developmental Biology)
Paper -HCT-1.2
(New)

Time : 3 Hours   Maximum Marks : 80

Instructions to candidates:

  1.   Section 'A' has all **compulsory** questions

  2.   Answer 'B' and 'C' sections as per instructions

Section - A

Answer the following in brief.   **(10x2=20)**

  1)   Schleiden shwan

  2)   Vesicle

  3)   Phagocysts

  4)   Chromomere

  5)   Nucleosome

  6)   Cell aging

  7)   Aerosome

  8)   Self- incompatibility

9) Oncogens

10) Antipodal cells

Section - B

Answer any **four** of the following   (4x6=24)

11. Ultra structure & functions of Lysosome

12. Chloroplast biogenesis

13 Mitotic Apparatus

14. Structure and function of eukaryotic flagella

15. Cytoplasmic male sterility

16. Molecular features of Telomers.

Section - C

Answer any **three** of the following   (3x12=36)

17. Describe the ultra structures and enzyme localization in mitochondria

18. Write a detailed account on various molecular events occurring in cell cycle

19 Describe the various embryonic developments in Frog

20. Write a detailed account on gene therapy.

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PGIS-N 1059 B-2K13
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 & any **four** of the remaining.

1.   Answer the following:-   (10×2=20)

    a)   Write the structure of L-glutamine at different pH values.

    b)   What are different conformations of DNA

    c)   Write the structure of glutathione

    d)   What is Bohr effect?

    e)   Write the structure of any one prostaglandin

    f)   How are peptides cleaved next to methionine?

    g)   Why are rotations around peptide bond not possible?

    h)   What are neutral fats? Give structure of any one of them.

    i)   Give the structure of any one pyrimidine and purine nucleotide present of DNA

    j)   What is buffer? Give example of any one buffer system of our body.

2.   a)   Derive Hendersson-Hesselbach equation and give its significance

    b)   Describe Sanger's method of DNA sequencing

    c)   Explain optical isomerism of glucose.   (5+5+5=15)

3. a) Write an account of the chemistry and biological importance of glycogen

   b) Distinguish between bilayer and micelle structure

   c) What is the basic recurring structural unit in peptidoglycan? How are they cross linked?

   (5+5+5=15)

4. a) Outline the steps involved in the Merifield solid phase synthesis of a peptide

   b) Why amino acids form Zwitterions? Give one example

   c) Give a scheme for the isolation of RNA from biological sample.   (5+5+5=15)

5. a) Explain the characteristics of the secondary structure present in silk fibroin

   b) Explain Ramachandran plot and its significance

   c) Give an account on tertiary structure of tRNA   (5+5+5=15)

6. a) What is Hill equation? Give its importance

   b) Define positive cooperativity. Discuss how oxygen molecule cooperatively binding to the hemoglobin

   c) What is abnormal hemoglobin? Explain sickle cell anemia.   (5+5+5=15)

7. Write a note on any **three** of the following   (3×5=15)

   a) Water is a universal solvent

   b) Role of chaperon proteins in protein folding

   c) Restriction endonucleases

   d) Salient features of α - helix of a protein

PGIS-O 1060 B-2K13

M.Sc. Ist Semester(Non-CBCS) Degree
Examination
Biochemistry
(Biophysical, Bio-organic chemistry & Biostatistics)
Paper - 1.2
(Old)

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:

  *Answer question No.1 & any **four** of the remaining.*

1.   Answer the following:-   (10×2=20)

  a)   What are enantiomers? Give examples.

  b)   Write the equation for first order reaction.

  c)   What is energy of activation?

  d)   How are free radicals produced?

  e)   Define specific rotation.

  f)   Name metal ions found in the biological system

  g)   Write the rate equation for reversible reaction

  h)   State standard deviation. What does it signify?

  i)   What is secondary salt effect?

  j)   What are nucleophiles? Give examples.

2.   a)   Discuss the electronic theory of valency.   (3×5=15)

  b)   Give an account of different types of hybridization of carbon in organic molecule.

  c)   Explain D and L configuration with an example.

3. a) Discuss SN^2 mechanism with an example (3×5=15)

b) What is muta rotation? Explain with an example.

c) Define optical isomerism. How is it different from geometric isomerism.

4. a) Give the experimental evidence for formation of carbocation intermediate in SN^1 mechanism. (3×5=15)

b) Discuss transition state theory.

c) Derive Henderson-Hasserbatch equation.

5. a) What are buffers? Discuss the mechanism underlying it with an example. (3×5=15)

b) Write an account on Metallo porphyrins

c) Discuss the kinetics of primary salt effect.

6. a) State the advantages and disadvantages of mean & median. (3×5=15)

b) Give an account of hypothesis testing

c) What is regression analysis?

7. Write a note on any **three** of the following (3×5=15)

a) Aromaticity

b) Hydrogen bonding

c) Fast reactions and their applications

d) Ion-product of water.

PGIS-O 1062 B-2K13

M.Sc. Ist Semester (Non-CBCS) Degree Examination

Biochemistry

(Nutrition)

Paper - 1.3

(Old)

Time : 3 Hours   Maximum Marks : 80

Instructions to candidates:

Answer question **no.1** and any **4** of the remainings.

1. Answer the following: (10×2=20)

    a) What are 'micro' and 'macro' nutrients? Give an example each.

    b) What is proximate analysis of food? Mention the methods of proximate analysis.

    c) Define one kilo calorie. Mention energy values of carbohydrates, proteins and fats.

    d) What is meant by specific dynamic action of food?

    e) What are dietary fibres? Mention their roles.

    f) Give structure and function of TAG.

    g) Outline nutritional classification of proteins with suitable examples.

    h) Name the vitamin whose deficiency causes scurvy. Mention its food sources.

    i) What is goitre? How can it be prevented?

    j) Define the terms 'Dehydration' 'Rehydration'.

2. a) Explain different methods of determination of energy value of foods.

    b) What is BMR? Add a note on factors affecting BMR.   (8+7=15)

3. a) Discuss classification functions and different sources of carbohydrates.

    b) What are EFAs? Discuss structures functions and deficiency symptoms of EFAs.
                                                                   (7+8=15)

4. a) Discuss methods employe to evaluate nutritine value of dietary proteins.

    b) Elaborate on causes, symptoms and prevention of PCM.   (7+8=15)

5. a) Describe how is water distributed in body fluids? Add a note on regulation of water balance in body.

   b) Discuss sources, functions and RDAs of fat soluble vitamins. (8+7=15)

6. a) Give sources, functions and deficiency symptoms of B complex vitamins.

   b) What are anti-nutrients? Add a note on lathyrogens. (9+6=15)

7. Write note on any **three** of the following: (3×5=15)

   a) Geriatric nutrition.

   b) Nutritional role of Na and K.

   c) N-balance studies.

   d) Food fortification programme.

PGIS-N 1069B-2K13

M.Sc Ist Semester (CBCS) Degree Examination
Biotechnology
(Microbiology)
Paper -HCT-1.3
(New)

Time : 3 Hours   Maximum Marks : 80

Instructions to candidates:

      1.Section 'A' has all **compulsory** questions

      2.Answer 'B' and 'C' sections as per instructions

Section - A

1.   Answer the following in brief.   (10x2=20)

   1)   Biogenesis

   2)   Negative staining

   3)   UHT

   4)   Streak plate Method

   5)   Irradiation

   6)   Fimbriae

   7)   Quorum sensing

   8)   Probiotics

   9)   Mutualism

   10) Continuous culture

Section - B

Answer any **four** of the following   (4x6=24)

11.   Write a note on germ theory of diseases

12.   Give an account of various differential staining methods

13   Explain the technique of isolation of microorganisms

14.   Explain the factors affecting the growth curve.

15.   Describe the contribution of Antony - Van leewenhoeck

16.   Write a note on microbial communication system.

Section - C

Answer any **three** of the following   (3x12=36)

17.   Describe the molecular methods is assessing microbial diversity

18.   Describe the isolation. cultivation and preservation methods of microorganisms

19   Write a detailed note on nutritional requirements and counting of bacteria

20.   Explain various types of microbe- microbe interactions with each examples.

PGIS-N 1061 B-2K13

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.

a)   Define the terms specific activity and turnover number of an enzyme   (2×10=20)

b)   What is stopped flow technique?

c)   What are suicide enzyme inhibitors? Give two examples.

d)   What is the effect of temperature on the enzyme activity?

e)   What are secondary plots?

f)   What is covalent catalysis? Give an example.

g)   What are zymogens? How are they activated?

h)   Give the coenzymatic functions of thiamine.

i)   What is Scatchard plot? Give its significance .

j)   Mention the isoenzymic property of LDH

2.   a)   Explain the classification of enzymes with suitable examples

b)   Outline the different strategies used to purify the enzyme

c)   Describe any two methods employed for assay of enzymes.   (4+6+5=15)

3. a) Derive the rate expression for a single substrate enzyme catalyzed reaction under steady state assumption.

   b) How are different reversible enzyme catalyzed reactions kinetically distinguished?

   c) How is isotopic-exchange study helpful in the investigation of reaction mechanism.
   (6+4+5=15)

4. a) Discuss the ping pong mechanism involved in bisubstrate enzyme catalyzed reaction with suitable example.

   b) What is active site of an enzyme? Discuss any three methods employed in identification of active site of an enzyme. (7+8=15)

5. a) Give an account of 3-Dimensional features of RNase as revealed by X-ray

   b) Discuss the mechanism of action of chymotrypsin

   c) Write the mechanistic role of nicotinamide nucleotide with suitable example.
   (6+4+5=15)

6. a) Describe the salient features of KNF model for allosteric behaviour of an enzyme.

   b) Write an account on different types of feed back regulations.

   c) Discuss the applications of immobilized enzymes (5+5+5=15)

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

   a) Enzyme localization

   b) Criteria of purity of enzymes

   c) Pyruvate dehydrogenase complex

   d) Enzyme electrodes (3×5=15)