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PGIS-1051 AB-18
M.Sc. I Semester (CBCS) Degree Examination
BIO-CHEMISTRY
(Biomolecules)
Paper -HCT 1.1

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

Answer **question 1** and any **four** of the remaining questions.

1. Answer the following: (10×2=20)

   a) Define pKa and give its importance in buffer preparation.

   b) Draw the chair and boat conformations of glucose and fructose.

   c) Name two hetero polysaccharides and write their structure.

   d) Name any two phospholipids with their structures.

   e) What are micelles? How are they formed?

   f) Write the structures of alanine at pH 2 and pH 10.

   g) Give the composition of glutathione.

   h) What is the role of 2,3 BPG in haemoglobin?

   i) Give the structure of purines, pyrimidines and their pairing in DNA.

   j) What is the relationship of Tm and Cot vales of DNA?

2. a) Explain the relationship of pH and pKa.

   b) Explain the importance of buffers in the biological systems.

   c) Depict the stereoisomers of aldoses. (3×5=15)

3. a) Describe the structural features of any two glycosaminoglycans.

   b) Give the structure and functions of sphingolipids.

   c) Give the structure and functions of cholesterol. (3×5=15)

4. a) Give the reactions of amino group of amino acids.
   b) How does dansyl chloride and CNBr react with a protein?
   c) Explain the structural features of collagen. (3×5=15)

5. a) Explain the structural features of myoglobin.
   b) Derive an equation to show that haemoglobin is an allosteric protein.
   c) Describe the Merrifield solid phase synthesis of a peptide. (3×5=15)

6. a) Give the structural features of DNA proposed by Watson and Crick.
   b) How is DNA sequenced by Sanger method? Explain.
   c) Give the structure and functions of t-RNA. (3×5=15)

7. Write short notes on any three of the following:
   a) Abnormal Haemoglobin.
   b) Antifreeze proteins
   c) Ramachandran plot.
   d) r-RNA. (3×5=15)

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PGIS-N 1054 AB-18

M.Sc. I Semester (CBCS) Degree Examination
BIO-CHEMISTRY
(Food and Nutrition)
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:

   a)   What is physiological energy value of food?   (10×2=20)

   b)   What is atherosclerosis?

   c)   What are antivitamins? Give example.

   d)   Define SDA of food

   e)   What is ORS? Give its compositon.

   f)   Give the functions of Mg. and Co.

   g)   What are the sources and deficiency disorders of Calcium?

   h)   Mention the sources of chemical contaminants in food.

   i)   What are fermented foods? Mention their importance.

   j)   What are goitrogens?

(2)

2. a) Explain the functions of food. Enumerate the purpose of five food group system.

   (7+8=15)

   b) Discuss the factors influencing BMR.

3. a) Discuss various methods used for food analysis (7+8=15)

   b) Explain Benedicts oxy calorimeric method for energy value determination of food.

4. a) Discuss the sources and importance of proteins in diet. (7+8=15)

   b) Discuss the involvement of microorganisms in food spoilage.

5. a) Write a note on food additives. (7+8=15)

   b) Enumerate different methods of food preservation

6. a) Discuss the sources and functions of Vit. A and Vit.C (7+8=15)
   b) Discuss the nutrition pattern for infants and preschool children.

7. Write a note on any **three** of the following :
   a) Phrynoderma (3×5=15)
   b) Vitamin B complex
   c) Electrolyte balance
   d) Food Pyramid.

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PGIS-1052 AB-18
M.Sc. I Semester (CBCS) Degree Examination
BIO CHEMISTRY
(Analytical Bio-Chemistry)
Paper - HCT 1.2

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 is Svedberg's constant?

   b. How dialysis is different from reverse dialysis?

   c. Distinguish Rt value from Rf values.

   d. What are spacer arms? How they are beneficial?

   e. How protein subunits linked via disulfide bonds are dissociated?

   f. How are protein bands visualized after electrophoresis?

   g. What is void volume and bed volume?

   h. Define radioactive units Curie and Becquerel?

   i. Give the limitations of Beer-Lambert's Law.

   j. Write the principle of ESR spectra.

                                                                    (4×15=60)

2. a. What is density gradient centrifugation? How it is useful in the separation of cellular organelles?

   b. Explain the use of analytical ultracentrifugation technique in determining the molecular weight of proteins. (8+7=15)

3. a. Explain the principle of affinity chromatography. How mRNA and monoclonal antibodies are purified by affinity chromatography?

   b. Explain ion exchange column chromatography with an example of cat-ion exchanger. (8+7=15)

4. a. Describe the physic-chemical properties of α, β, and γ radiations.

   b. What is scintillation cocktail? What is the role of primary and secondary flours?

   (8+7=15)

5. a. State the principle and construction of spectrophotometer. How it is different from fluorimeter.

   b. State the principle and application of infrared spectroscopy. (8+7=15)

6. a. Explain the principles of SDS- PAGE. Explain its use in sub unit analysis and molecular weight determination.

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

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

   a. Autoradiography.

   b. Circular Dichroism.

   c. Electron microscope.

   d. RpHPLC

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PGIS-N 1053 B-18

M.Sc. I Semester (CBCS) Degree Examination

BIO-CHEMISTRY

Cell Biology & Microbiology

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)   Mention few characteristics of protein kinases.   (10×2=20)

   b)   State Fick's law of diffusion.

   c)   Give a neat labelled diagram of rod and cone cells.

   d)   What is acid fast staining?

   e)   Name two examples each for spore producing and photosynthetic bacteria

   f)   What is sterilization? Mention the different methods of sterilization.

   g)   What is synchronous growth? Depict it diagrammatically.

   h)   Differentiate between endemic and epidemic diseases with one example each.

   i)   What is a batch culture?

   j)   Differentiate between bacteriostatic and bactericidal agents with one example each.

2. a) Describe the Singer Nicolson model of biological membrane. Add a note on organization of different proteins in membrane. (8+7=15)

   b) Describe the operation of Na^+/K^+ ATPase.

3. a) Discuss the ultra structural organization of protein composition of muscle. Add a note on mechanism of muscle contraction. (8+7=15)

   b) What are neurotransmitters? Give the mechanism of nerve-impulse transmission.

4. a) What is Gram-staining? Add a note on Gram +ve and Gram -ve bacterial cell wall. (7+8=15)

   b) Discuss conventional and molecular methods of classification of bacteria.

5. a) Describe how are cultures isolated characterized and preserved in the laboratory. (8+7=15)

   b) Depict a typical bacterial growth curve. Add a note on factors affecting bacterial growth.

6. a) Discuss importance of soil flora in maintaining soil fertility (5+5+5=15)

   b) Give an account on biocontrol of crop disease.

   c) Discuss any two diseases caused by fungi to human being.

7. Write notes on any three of the following :

   a) Voltage gated ion channel (3×5=15)

   b) Molecular mechanism of olfaction

   c) Chemostat.

   d) Hospital associated Human diseases.

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PGIIS-2054 A-19
MSc. II Semester (CBCS) Degree Examination
BIOCHEMISTRY
(Nutritional Biochemistry)
Paper - OET 2.1

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)   Define nutrition. Mention different types of nutrients.

    b)   What is "Fortification"? Give its importance.

    c)   Define the BMR. How do you calculate BMR?

    d)   Give the nutritive values milk and beverages.

    e)   What are Vitamins? Why are they essential?

    f)   Give the role of trace elements in the biological systems.

    g)   What is ORS? Give its nutritive value.

    h)   Explain the special aspect of nutrition Lathyrism.

    i)   Write any two differences between rehydration and dehydration.

    j)   Expand the term "PUFA". Give their nutritional significance.

2. a)   Explain the difference between essential and non - essential amino acids and give their significant role in the living organisms.

    b)   What is Phrynoderma? Mention the causes for it.

    c)   Explain in brief nitrogen balance.   (5+5+5=15)

3. a) Explain the term food metabolism, factors affecting the BMR and energy requirement for the physical activities of normal individual.

   b) What is the structure, functions and deficiency of vitamin A? (8+7=15)

4. a) Explain the role of nutrition in Adolescence and pregnancy.

   b) State and explain the phenomenon of water intake and loss from living system.

   c) What is electrolytic balance and explain its regulation? (15)

5. a) Explain the term Protein Calorific Malnutrition and cause for preventive measures for Kwashiorkor and Marasmus.

   b) Explain the structure and function of Cholesterol.

   c) What is SDA of foods? and Mention its significance. (5+5+5=15)

6. a) Explain in brief nutritive value of proteins.

   b) Explain the phenomenon of water distribution in the body systems.

   c) Explain the major role played by nutrition in childhood. (5+5+5=15)

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

   a) Vitamin - D.

   b) Nutritive values of meat and fishes.

   c) RDA for an athlete.

   d) Pro and anti vitamins. (3×5=15)

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