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PGIS-210 A-21
M.Sc. I Semester (CBCS) Degree Examination
BIOCHEMISTRY
Biomolecules
Paper : HCT 1.1

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

Answer Q.**1** and any **4** of the remaining.

Answer any Ten of the following: **(10×2=20)**

1. a) What are buffers? Write their importance.

b) What do *d* and *l* mean and signify?

c) Write the composition of waxes.

d) Why do amino acids behave as acids and bases?

e) Name non-protein amino acids. Write their roles.

f) Write the principle of the techniques employed for separation of amino acid mixtures.

g) What is meant by 'β-structure' of a protein?

h) With an example define a disulphide bond.

i) Define Hill equation. Write its importance

j) Write the structure of adenylic acid.

k) What are restriction enzymes?

l) Define C_0t value. What does it signify?

2. a) Explain the concept of optical isomerism with example.

b) Write an account on the structures of disaccharides. **(8+7=15)**

3. a) Explain the structure of a peptide bond. Add a note on natural peptides.

b) Explain the sequencing of protein from its N-terminal end. **(8+7=15)**

4. a) Explain Ramchandran plot and its applications.

b) Explain the technique to establish the molecular basis of Sickle cell Anemia. **(8+7=15)**

5. a) Explain the isolation and purification of DNA.

   b) Write a comparative account on A-DNA, B-DNA and Z-DNA. **(8+7=15)**

6. a) Write a note on structure of cholesterol and Liposomes.

   b) Explain the structure of secondary and tertiary structure of t-RNA. **(8+7=15)**

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

   a) RS nomenclature.

   b) Cooperative oxygen binding.

   c) Terpenes.

   d) Maxam-Gilbert method.

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PGIS-213 A-21
M.Sc. I Semester (CBCS) Degree Examination
BIOCHEMISTRY
Food And Nutrition
Paper : SCT 1.1

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

Answer Q.1 and any **4** of the remaining.

Answer any Ten of the following: **(10×2=20)**

1. a) Distinguish between macronutrients and micronutrients and give an example for each.
   b) What is "Food Fortification"? Give examples.
   c) What are anti-vitamins? Give example.
   d) Define RDA and mention its importance.
   e) Name any two examples for common food adulterants of spices.
   f) What is ORS? Give its composition.
   g) Give the physiological fuel values of carbohydrates, proteins and lipids.
   h) What is the total carbohydrate content of an adult human? How is it distributed?
   i) Expand the terms 'FDA', 'ISI', 'WHO' and 'PFA'.
   j) Name any two microorganisms causing food spoilage.
   k) What are essential fatty acids? Give an example.
   l) What is night blindness? How can you prevent it?

2. a) Describe the ICMR classification of food groups. Mention their functions. **(7+8=15)**
   b) How is energy the value of a food is determined by Bomb calorimeter?

3. a) What is BMR? Discuss the factors affecting it. **(7+8=15)**
   b) Discuss the sources and importance of proteins in diet.

4. a) Give the natural sources of sugars and mention their physiological role. **(7+8=15)**

   b) Explain PCM and its prevention.

5. a) Discuss different methods of food preservation. **(7+8=15)**

   b) Discuss the food fortification programs in India.

6. a) Write a note on sources and deficiency disorders of Vit. C and Vit. A. **(7+8=15)**

   b) Discuss the regulation of water and electrolyte balance in the body.

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

   a) Geriatric nutrition.

   b) Fermented foods.

   c) Good Manufacturing Practices.

   d) Benedict's Oxy calorimeter.

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PGIS-211 A-21
M.Sc. I Semester (CBCS) Degree Examination
BIOCHEMISTRY
Analytical Biochemistry
Paper : HCT 1.2

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidate:

Answer Q.**1** and any **4** of the remaining.

I. Answer any Ten of the following: **(10×2=20)**

a) Define svedberg unit.

b) Give the principle of gel-permeation chromatography. Mention the sequence of elution of molecules from the column.

c) What is native electrophoresis? Why it is called so?

d) Who discovered radioactivity? Define curie and becquerel.

e) State Beer-Lambert's law. Give its limitation.

f) Name different types of rotors used in centrifugation.

g) Why lipids, but not proteins are generally analyzed in gas chromatography?

h) Why proteins precipitate at their isoelectric point?

i) What information is gathered from TEM and SEM analysis?

j) What are primary and secondary flours? Name them.

k) Distinguish between UV spectroscopy and fluorescence spectroscopy.

l) Elaborate on electromagnetic spectrum.

2. a) Describe density gradient centrifugation. Add a note on the types of gradients used.

b) Describe equilibrium dialysis. Add a note on ultrafiltration. **(8+7=15)**

3. a) Discuss the ion exchange chromatography.

b) Write on the principle and applications of thin layer chromatography. **(8+7=15)**

4. a) Describe reducing and non-reducing SDS-PAGE.

   b) Explain 2D electrophoresis. Write on its applications. **(8+7=15)**

5. a) Discuss the instrumentation of liquid scintillation counter.

   b) Describe tracer technique and its applications. **(8+7=15)**

6. a) Explain MALDI-TOF and its applications.

   b) Discuss atomic absorption spectroscopy. Add a note on its applications. **(8+7=15)**

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

   a) Confocal microscopy.

   b) Analytical ultracentrifugation.

   c) Paper chromatography.

   d) ESR spectroscopy.

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PGIS-212 A-21

M.Sc. I Semester (CBCS) Degree Examination

BIOCHEMISTRY

Cell Biology and Microbiology

Paper : HCT 1.3

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

Answer Q.**1** and any **4** of the remaining.

Answer any Ten of the following: **(10×2=20)**

1. a) Give classification of protein kinases. Mention their characteristics.

b) What are P-type ATPases? Give example.

c) Give the structure of cell.

d) Name the components of myofibril.

e) What is acid fast staining? Name few bacteria that take up acid fast stain.

f) What are Archaebacteria? How do they differ from Eubacteria?

g) Define sterilization? Mention their types.

h) What are phototrophic bacteria? Give examples.

i) What is meant by continuous culture system?

j) Differentiate between bacteriostatic and bactericidal agents with examples for each.

k) What is MIC?

l) Mention few diseases caused by bacteria and fungi.

2. a) Discuss meiotic cell cycle.

b) Explain the salient features of Singer-Nicholson model. **(7+8=15)**

3. a) Describe the transport mechanism of voltage gated ion channels.

b) Discuss about transport of glucose across bio membrane. **(7+8=15)**

4. a) Explain the structure of bacterial cell wall.

   b) Describe methods of isolation and preservation of pure cultures. **(7+8=15)**

5. a) Discuss on bacterial growth curve.

   b) Discuss control of microbial growth by physical and chemical methods. **(6+9=15)**

6. a) Discuss on soil microflora and their importance.

   b) How are animal viruses classified? Write a note on isolation of viruses. **(7+8=15)**

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

   a) Chemostat.

   b) Biocontrol of crop diseases.

   c) Bacterial endotoxins.

   d) Antibiotic assay.