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**PGIS-013-A-22**  
**M.Sc. I Semester Degree Examination**  
**BIOCHEMISTRY**  
**Food and Nutrition**  
**Paper : SCT - 1.1**

**Time : 3 Hours**

**Maximum Marks : 80**

***Instructions to Candidates :***

***Answer question one and any four of the remaining.***

**Answer any TEN of the following.**

**(10×2=20)**

1.
  - a) What is RDA? Mention its importance.
  - b) Define food fortification. Give its importance.
  - c) What is good source of iron?
  - d) Differentiate between macro and micro nutrients with suitable examples.
  - e) What is ORS? Give its composition.
  - f) What are antivitamin? Give example.
  - g) Name the microorganisms involved in food spoilage.
  - h) What is Phrynoderma? Mention the cause for its occurrence.
  - i) Expand and mention the significance of MUFA and PUFA..
  - j) Why is labelling of food important?
  - k) Draw the skeletal formula of linolenic acid.
  - l) Mention any two milk adulterants and methods to detect the same.
2.
  - a) Discuss the classification of foods.
  - b) Enumerate the role of essential fatty acids.
  - c) Discuss sources, types and role of dietary fibres.

**(5+5+5=15)**

3. a) What is BMR? Discuss factors affecting it.  
b) What is PCM? Discuss causes and preventive measures for Kwashiorkor and Marasmus. (8+7=15)
4. Explain structure, sources and deficiency symptoms of the following  
a) Vitamin A  
b) Vitamin C  
c) Vitamin D (5+5+5=15)
5. a) Describe the different methods of food preservation.  
b) What are Good Manufacturing Practises? Explain. (8+7=15)
6. a) What is water balance ? Explain the regulation of water balance.  
b) Explain the role of nutrition in adolescence and pregnancy. (7+8=15)
7. Write notes on any **THREE** of the following : (3×5=15)  
a) Proximate analysis of food  
b) Food allergy  
c) Bomb calorimeter  
d) Natural toxicants in food.

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PGIS-011-A-22

M.Sc. I Semester Degree Examination

BIOCHEMISTRY

Analytical Biochemistry

Paper : HCT 1.2

Time : 3 Hours

Maximum Marks : 80

*Instructions to Candidates: Answer question one and any four of the remaining.*

Answer any TEN of the following.

(10×2=20)

1.
  - a) Give the principle of iso-electrofocusing.
  - b) What is void volume and bed volume?
  - c) Outline principle of Pulse Field Gel Electrophoresis.
  - d) What are different types of ion-exchangers? Give examples.
  - e) Mention types of isotopes with suitable examples.
  - f) Give principle of atomic absorption spectroscopy.
  - g) Write principle and applications of dialysis.
  - h) Give the principle of TLC and mention its merits over paper chromatography.
  - i) Write principle of CD-ORD.
  - j) Define molar extinction co-efficient.
  - k) Outline principle of IR spectroscopy? Mention its two applications.
  - l) Give principle of capillary electrophoresis.
2.
  - a) Explain principle and procedure of gas chromatography.
  - b) Discuss principle, procedure and applications of HPLC. (8+7=15)
3.
  - a) What is density gradient centrifugation? Discuss with suitable example.
  - b) Discuss the working principle of Fluorescence microscopy. Add a note on its applications. (8+7=15)

4. a) Give an account on agarose gel electrophoresis and its applications.  
b) Discuss the working principle and applications of high voltage electrophoresis. (8+7=15)
5. a) Write the construction of GM counter and mention its applications in biological science.  
b) Give an account on Autoradiography and its applications. (8+7=15)
6. a) Draw a block diagram of UV-Vis spectrophotometer. Briefly describe how you would experimentally determine the concentration of a protein spectrophotometrically?  
b) Discuss principle and applications of NMR spectroscopy. (8+7=15)
7. Write notes on any **THREE** of the following : (3×5=15)
- a) 2D Electrophoresis.
  - b) Affinity Chromatography
  - c) Ultracentrifugation.
  - d) Mass spectroscopy.

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PGIS-012-A-22

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 question ONE and any FOUR of the remaining.*

Answer any TEN of the following.

(10×2=20)

1.
  - a) List the components of a eukaryotic cell.
  - b) Why is meiosis considered reduction division?
  - c) What is meant by an integral protein?
  - d) Define diffusion.
  - e) What is olfaction? What is its role?
  - f) What is a sarcomere?
  - g) Write briefly on different shapes observed in bacteria.
  - h) What are neurotransmitters? Give example.
  - i) Write the characteristics of mycoplasma.
  - j) What is Pasteurization?
  - k) Define disinfection. Write two examples.
  - l) Name two diseases caused by different parasites.
2.
  - a) Explain the methods employed for sub-cellular fractionation of cell organelles.
  - b) Describe cell cycle and its regulation. (8+7=15)

3. a) Write the mechanism of transport by various ATP ases.  
b) Explain the steps involved in the transmission of nerve impulse. (8+7=15)
4. a) Describe the structural components of a bacterial cell.  
b) Elaborate on conventional methods adopted for classification of bacteria. (8+7=15)
5. a) Write in detail on sterilization methods of bacteriological media.  
b) Depict a typical bacterial growth curve and explain the factors that influence bacterial growth. (8+7=15)
6. a) Explain Singer-Nicolson model of membranes.  
b) Write an essay on mechanism of vision. (8+7=15)
7. Write notes on any **THREE** of the following : (3×5=15)
  - a) Cardiac muscle contraction and regulation.
  - b) Cyanobacteria.
  - c) Chemostat.
  - d) Bacterial endotoxins.

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PGIS-010-A-22

M.Sc. I Semester Degree Examination

BIOCHEMISTRY

Biomolecules

Paper : HCT 1.1

Time : 3 Hours

Maximum Marks : 80

*Instructions to Candidates : Answer question No. 1 and any four of the remaining.*

Answer any TEN of the following.

(10×2=20)

1. a) Define buffer and buffer action.
- b) Draw different configurations for glucose
- c) Give the structural features of starch
- d) What are bile salts? Give examples.
- e) Give the structure of sphingolipid and its function.
- f) Write the features of peptide bond.
- g) How does amino acid react with ninhydrine?
- h) Write the structural features of alpha keratin.
- i) What is the role of BPG on haemoglobin?
- j) How is  $T_m$  of DNA determined?
- k) Sketch and label the clover leaf model of tRNA.
- l) Mention stereo isomers of keto-sugars.

2. a) Derive the Hendersson-Hesselbach equation and give its importance.  
b) What is pKa ? How is it determined? (8+7=15)
3. a) What are homopolysaccharides? Add a note on their structures and functions.  
b) Give the classification of lipids with example for each class. (8+7=15)
4. a) Explain the action of phenylisothiocyanate and CNBr on protein  
b) Draw the titration curve for glycine.  
c) Describe the structural features of collagen. (3×5=15)
5. a) Describe the structural features of haemoglobin and myoglobin.  
b) Derive the hill equation for oxygen binding to haemoglobin. (8+7=15)
6. a) Write the structural features of A,B - and Z-DNA.  
b) Describe DNA sequencing methods. (8+7=15)
7. Write notes on any **THREE** of the following : (3×5=15)  
a) Structure of bacterial cell wall  
b) Ramachandran plot  
c) Abnormal hemoglobins  
d) Restriction endonucleases.