

SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION  
APRIL 2021

## Biochemistry

## BCH 2C 02—BIOCHEMISTRY—II

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer all questions.**Each question carries 1 mark.*

- In gel filtration chromatography molecules are separated on the basis of their :
  - Charge.
  - Solubility.
  - Size.
  - Affinity.
- The \_\_\_\_\_ buffer plays a major role in maintaining the pH of blood.
  - Phosphate.
  - Bicarbonate.
  - Citrate.
  - Acetate.
- The essential catalyst used in polyacrylamide gel electrophoresis (PAGE) is :
  - Sodium dodecyl sulphate.
  - Tetramethylethylenediamine.
  - Ammonium persulfate.
  - Bisacrylamide.
- The wavelength range of visible light is :
  - 700-800 nm.
  - 400-700 nm
  - 200-400 nm.
  - 800-1000 nm.
- Define Diffusion.
- What is partition co-efficient ?
- Write Henderson-Hasselbach equation.
- Calculate the pH of 0.1N HCl.
- Define colloid.

(9 × 1 = 9 marks)

**Turn over**

**Section B**

*Answer at least six questions.*

*Each question carries 3 marks.*

*All questions can be attended.*

*Overall Ceiling 18.*

10. What are Buffers ? Give two examples.
11. How coagulation of blood occurs ?
12. Discuss on the instrumentation of colorimeter.
13. List the applications of immunoelectrophoresis.
14. Name any *three* indicators commonly used to measure pH. Mention color and pH range.
15. What are the three different types of osmotic solutions ?
16. Write down the properties of colloids.
17. Give the differences between active transport and passive transport.

(6 × 3 = 18 marks)

**Section C**

*Answer at least three questions.*

*Each question carries 7 marks.*

*All questions can be attended.*

*Overall Ceiling 21.*

18. How amino acids are separated by thin layer chromatography.
19. Discuss on the titration curve of weak acid.
20. How acid-base balance is maintained in our body ?
21. Write down the principle and procedure of ion exchange chromatography.
22. Distinguish between lyophilic and lyophobic colloids.

(3 × 7 = 21 marks)

**Section D**

*Answer any one question.*

*It carries 12 marks.*

23. Explain the principle, procedure and application of gas liquid chromatography.
24. Describe SDS-PAGE.

(1 × 12 = 12 marks)

**SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021****Biochemistry****BCH 2B 02—BIO MOLECULES**

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What are conjugated proteins ? Give an example.
2. Illustrate the formation of a dipeptide.
3. Define acid number and mention its significance.
4. How are sugar acids formed ?
5. Draw the structure of maltose and cellobiose.
6. What is SCOP ?
7. Define multiple sequence alignment.
8. Mention the role of vitamin K in blood coagulation.
9. Structurally differentiate the sugar component in RNA and DNA.
10. Write about the biochemical basis of scurvy.
11. What are ketogenic amino acids ? Give the structure of a ketogenic amino acid.
12. List out any four functions of phosphorus.

(8 × 3 = 24 marks)

**Section B***Answer at least five questions.**Each question carries 5 marks.**All questions can be attended.**Overall Ceiling 25.*

13. Give a brief account of Ramachandran Plot.
14. Write about BLAST.

**Turn over**

15. Give a brief account of the different forces stabilizing protein structure.
16. Draw the structure of cholesterol, ergosterol and calcitriol.
17. Differentiate between RNA and DNA.
18. How are amino acids classified on the basis of charge and polarity ?
19. Write about the functions and deficiency diseases associated with Iodine and Iron.

(5 × 5 = 25 marks)

### Section C

*Answer any one question.*

*The question carries 11 marks.*

20. Give a detailed account of biological databases.
21. Discuss in detail the general reactions of amino acids.

(1 × 11 = 11 marks)

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION  
APRIL 2021

Biochemistry

BCH 2C 02—BIOCHEMISTRY—II

Time : Three Hours

Maximum : 64 Marks

**Section A**

*Answer all the questions.  
Each question carries 1 mark.*

1. Name two basic amino acids.
2. \_\_\_\_\_ is the most abundant GAG.
3. Name an oligomeric protein.
4. Write down the specificity of protein cleavage by trypsin.
5. Name the non-reducing disaccharide and the bond present in it.
6. Write the name of an essential fatty acid.
7. The sugar present in DNA is \_\_\_\_\_.
8. Name the optically inactive amino acid.
9. Presence of rancidity in fat is given by \_\_\_\_\_.
10. Name a reaction specific to aromatic amino acids.

(10 × 1 = 10 marks)

**Section B**

*Answer any seven questions.  
Each question carries 2 marks.*

11. Draw the linear and cyclic structure of glucose.
12. Define saponification number and mention its significance.
13. What are Epimers ? Give an example.
14. How are osazones formed ?

**Turn over**

15. Write about Xanthoproteic reaction.
16. Represent the Haworth structure of isomaltose.
17. What are sugar alcohols ?
18. Draw the structure of tryptophan.
19. What is meant by oxidative deamination of an amino acid ?
20. What are Sphingolipids ?

(7 × 2 = 14 marks)

### Section C

*Answer any **four** questions.  
Each question carries 5 marks.*

21. Discuss about protein denaturation.
22. Represent the structure of cholesterol and mention its functions.
23. How is C-terminal amino acid identification done ?
24. Write about heteropolysaccharides and their functions.
25. Write a comparison between RNA and DNA.
26. Discuss about the basic physiological functions of lipids.

(4 × 5 = 20 marks)

### Section D

*Answer any **two** questions.  
Each question carries 10 marks.*

27. Discuss about the different levels of structural organization of proteins.
28. Write an essay on structure, functions and properties of homopolysaccharides.
29. Give a detailed account of classification, structure and functions of fatty acids.
30. Explain the Watson and Crick model of DNA.

(2 × 10 = 20 marks)

## SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

## Biochemistry

## BCH 2B 02—CELLULAR BIOCHEMISTRY

Time : Three Hours

Maximum : 80 Marks

## Section A

*Answer all questions.**Each question carries 1 mark.*

1. \_\_\_\_\_ have enzymes that oxidize long chain fatty acids and amino acids.
2. Cells or organisms that possess a clearly defined nucleus are \_\_\_\_\_.
3. Mitochondria is called power house of the cell because it produces \_\_\_\_\_.
4. ECM is elaborated as \_\_\_\_\_.
5. \_\_\_\_\_ are membrane proteins that play a key role in integrating the extracellular and intracellular environment.
6. Plasma membrane is a mosaic of \_\_\_\_\_.
7. Name two membrane lipids.
8. Proteins present in micro tubules are \_\_\_\_\_.
9. Chromosomes are duplicated during \_\_\_\_\_ phase of cell cycle.
10. Energy is required for simple diffusion. True or false ?
11. Apoptosis is \_\_\_\_\_.
12. \_\_\_\_\_ reversibly binds ions and transport them across cell membrane.
13. Which of the following is involved in desmosomal adhesion ?
  - A) Microfilaments.
  - B) Intermediate filaments.
  - C) Microtubules.
14. Which transporters transport a specific species in either direction governed only by concentrations of the species on either side of the membrane :
  - A) Symporter.
  - B) Uniporter.
  - C) Antiporter.
15. Cell division occurring in somatic cells is \_\_\_\_\_.
16. \_\_\_\_\_ is the most abundant protein in human body.

(16 × 1 = 16 marks)

**Turn over**

**Section B**

*Answer any **eight** questions.  
Each question carries 3 marks.*

17. Give three marker enzymes specifying the corresponding organelles.
18. Describe the events occurring during interphase.
19. List out any three functions of nucleus.
20. Comment on transport of water across membrane. State one of its biological significance.
21. Name the different phases of mitosis.
22. Draw a neatly labeled diagram of mitochondria.
23. Explain symport with an appropriate example.
24. Explain the structural characteristics of tight junction.
25. Bring out three differences between benign tumor and malignant tumor.
26. Give a labelled diagram explaining the process of metaphase II of meiosis II.

(8 × 3 = 24 marks)

**Section C**

*Answer any **four** questions.  
Each question carries 5 marks.*

27. How are prokaryotes different from eukaryotes ? Any five differences.
28. Describe facilitated diffusion using suitable example.
29. State the general properties of cancer cells.
30. Brief on the membrane proteins involved in cell-cell adhesion.
31. Give a brief note on cytoskeleton of eukaryotic cells.
32. How is apoptosis different from necrosis ?

(4 × 5 = 20 marks)

**Section D**

*Answer any **two** questions.  
Each question carries 10 marks.*

33. Give the structure and function of : (i) Chloroplast ; (ii) Golgicomplex ; (iii) Ribosomes ; (iv) Chromosomes.
34. Describe the events occurring during prophase I of meiosis.
35. Detail the functions and structural components of Extra Cellular Matrix.

(2 × 10 = 20 marks)