

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION  
NOVEMBER 2017**

(CUCBCSS—UG)

Biotechnology

BTY 3B 03—BIOCHEMISTRY

Time : Three Hours

Maximum : 80 Marks

**Section A***Answer any two out of four questions in about 1,500 words.**Each question carries 10 marks.*

1. Explain the arrangement of electron carriers in the electron transport chain.
2. Discuss the steps in urea cycle, indicating the compartmentalisation of enzymes involved.
3. Derive Michaelis-Menten equation and define  $K_m$ . Outline a method to determine  $K_m$  and  $V_{max}$ .
4. Discuss the physiological functions and deficiency disorders of any four water soluble vitamins.

(2 × 10 = 20 marks)

**Section B***Answer any seven out of fourteen questions in about 750 words.**Each question carries 5 marks.*

5. Explain the buffer action of acetate buffer.
6. Outline the steps in glycolysis under anaerobic condition and indicate the number of ATP molecules formed.
7. What are carbohydrates ? How are they classified ? Explain with suitable examples.
8. Explain the following properties of aminoacids :
  - (a) Amphoteric property.
  - (b) Reaction with ninhydrin.
  - (c) Reaction with nitrous acid.
  - (d) Reaction with formaldehyde.
  - (e) Optical property.
9. Explain the various secondary structures of proteins.
10. Outline the classification of lipids with suitable examples.

**Turn over**

11. How is palmitic acid oxidised to acetyl CoA ? Explain.
12. Discuss the base composition of nucleic acids with the help of structures.
13. Explain the features of DNA double helix with the help of a neat diagram.
14. How are enzymes classified ? Explain with examples.
15. Explain the different types of enzyme inhibition.
16. Discuss the physiological functions of insulin.
17. Explain the role of vitamin A in vision.
18. Outline the principle behind the separation of amino acids by ion-exchange chromatography.

(7 × 5 = 35 marks)

### Section C

*Answer all questions in about 300 words.  
Each question carries 3 marks.*

19. Biological buffer systems.
20. Chemiosmotic theory.
21. Globular proteins and fibrous proteins.
22. Types of DNA.
23. Principle of gel filtration.

(5 × 3 = 15 marks)

### Section D

*Answer all questions in about 200 words.  
Each question carries 2 marks.*

24. Distinguish between acidic and basic amino acids with examples.
25. Write the structure of cholesterol.
26. What are reducing disaccharides ? Give the structure of one reducing disaccharide.
27. List any *four* functions of proteins.
28. How can you locate the positions of DNA molecules separated by Agarose gel electrophoresis ?

(5 × 2 = 10 marks)