



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY**

FIRST SEMESTER – NOVEMBER 2016

**16PBT1MC02 - BIOCHEMISTRY**

Date: 04-11-2016  
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

**PART – A**  
**Answer ALL the Questions**

**I. Choose the correct answer**

**(5 x 1 = 5 Marks)**

- The total number of chiral centers in glucose is  
a) 1                                      b) 2                                      c) 3                                      d) 4
- What will be the length of an  $\alpha$ -helix with 10 amino acids?  
c) 10 Angstrom      b) 15 Angstrom      c) 20 Angstrom      d) 25 Angstrom
- Which among the following is a membrane bound enzyme?  
a) Citrate synthase                                      b) Succinate dehydrogenase  
c) Fumarase                                      d) Cis -Aconitase
- Pyruvate dehydrogenase is located at which of the following sites in mitochondria?  
a) Outer membrane    b) Inner membrane    c) Matrix                                      d) Cristae
- The following are true about enzymes **EXCEPT**  
a) Some enzymes require a cofactor for activity  
b) Vitamins function as coenzymes  
c) The coenzyme part of an enzyme is called apoenzyme  
d) Enzyme bound with coenzyme is called holoenzyme

**II. State whether the following are true or false..**

**(5 x 1 = 5 Marks)**

- The density of ice is lower than water.
- Sphingomyelin is present in the nervous tissues.
- Plastocyanin is a membrane bound carrier.
- Synthesis of fatty acids happens in the mitochondria.
- Enzymes lower the activation energy of a reaction.

**III. Complete the following**

**(5 x 1 = 5 Marks)**

- The bond angle of water is \_\_\_\_\_.
- Chitin is a homopolysaccharide made up of \_\_\_\_\_.
- In cholesterol synthesis, three acetates are condensed to \_\_\_\_\_.
- Ubiquitinated proteins are degraded by large complex called \_\_\_\_\_.
- The enzymes which catalyze the transfer of function groups to water is \_\_\_\_\_.

**IV. Answer the following, each within 50 words**

**(5 x 1 = 5 Marks)**

16. State the second law of thermodynamics.
17. Define conformation.
18. Why is photosystem I called P700?
19. Give the general structure of a triacylglycerol.
20. What is a prosthetic group?

**PART – B**

**Answer the following, each within 500 words. Draw diagrams wherever necessary. (5 × 8 = 40 Marks)**

21. (a) Derive Henderson –Hasselbalch equation.  
OR  
(b) Comment on the titration curve of acetic acid.
22. (a) Comprehend the secondary structures of protein.  
OR  
(b) Classify membrane lipids based on their structures.
23. (a) Analyze the reasons behind the hydrolysis of ATP.  
OR  
(b) Summarize the steps involved in Citric acid cycle and provide the energetics for the same.
24. (a) Illustrate the importance of carnitine shuttle in fatty acid catabolism.  
OR  
(b) Discuss any one protein degradation pathway.
25. (a) Explain the free energy changes in enzyme catalyzed reactions using a reaction coordinate diagram.  
OR  
(b) Write notes on: i) Covalent catalysis ii) suicide in activators

**PART – C**

**Answer any TWO of the following each, within 1500 words. Draw diagrams wherever necessary.**

**(2 × 20 = 40 Marks)**

26. Devise a method to separate of proteins based on their charge and molecular mass.
27. Describe ion product of water and explain the principle, mechanism of working of a pH meter.
28. Give an overview on the components involved in photophosphorylation in plants and summarize the steps of cyclic and non-cyclic photophosphorylation.
29. Elaborate on the mechanisms of enzyme inhibition.

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