

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

FIRST SEMESTER – APRIL 2022

PBT 1502 – BIOCHEMISTRY

Date: 18-06-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

PART – A

Answer ALL the Questions

I. Choose the correct answer

(5 x1= 5 Marks)

1. What does first law of thermodynamics state?
 - a) Energy can neither be destroyed nor created
 - b) Energy cannot be 100 percent efficiently transformed from one type to another
 - c) All living organisms are composed of cells
 - d) Input of heat energy increases the rate of movement of atoms and molecules
2. Which nutrient provides the maximum energy on breakdown?
 - a) Carbohydrates
 - b) Fats
 - c) Fibres
 - d) Proteins
3. Photosynthesis is:
 - a) An oxidation-reduction reaction
 - b) Synthesis reaction
 - c) Organic reaction
 - d) Replacement reaction
4. Which allows the enzyme to combine with its substrate?
 - a) Cofactor
 - b) Metal ion
 - c) Coenzyme
 - d) None
5. Transamination is the process where
 - a) Carboxyl group is transferred from amino acid
 - b) α -amino group is removed from the amino acid
 - c) Polymerisation of amino acid takes place
 - d) None of the above

II. State whether the following are true or false.

(5x1=5 Marks)

6. Ethers are formed by the attachment of two alkyl groups to same oxygen atom.
7. Non-essential amino acids are not present and are acquired through food.
8. Glycolysis occurs under anaerobic conditions.
9. Enzymes accelerate reactions by lowering the activation energy.
10. The ability of water to stick to glass, this phenomenon is known as adhesion.

III. Complete the following

(5x1= 5 Marks)

11. The _____ of a solution is determined by relative concentration of acids and bases.
12. _____ is the most common monomer of Carbohydrate?
13. The electron transport chain is located in the _____?

14. Coenzymes are often used in transporting _____ from one enzyme to another.
15. _____ is made by combining glycerol, two fatty acids and an alcohol.

IV. Answer the following within 50 words

(5 x 1 = 5 Marks)

16. Why is water called a universal solvent?
17. What are the five classifications of lipids?
18. Why is ATP called high energy?
19. What affects enzyme catalysis?
20. Write a short note on Fischer projection with an example?

PART B

Answer the following each within 500 words.

(5 x 8 = 40 Marks)

Draw diagrams wherever necessary

21. (a). Highlight the properties of an Acid-Base equilibrium with examples.

OR

(b) Discuss the classification of Triglycerides.

22. (a) Explain $2\text{H}_2\text{O} + 2\text{NADP}^+ + 3\text{ADP} + 3\text{P}_i \rightarrow \text{O}_2 + 2\text{NADPH} + 3\text{ATP}$.

OR

(b) Give the difference between reduction and oxidation with examples.

23. (a) How enzymes make reactions go faster?

OR

(b) Discuss the five critical properties of water.

24. (a) How do we extract ATP, the chemical energy from TAG?

OR

(b) Elaborate with examples on storage and structural polysaccharides.

25. (a) Elaborate on transamination and deamination of amino acids?

OR

(b) Classify and explain the nomenclature of carbohydrates.

PART – C

Answer any TWO of the following, each within 1500 words.

(2 x 20 = 40 Marks)

Draw diagrams wherever necessary.

26. Enumerate the electron transport system located in the mitochondria.
27. Explain activation energy with a coordinate diagram.
28. Describe the amino acid metabolism.
29. Give a detailed explanation of the Michaelis-Menten equation.

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