

CHAPTER 3

Biomolecules

Analysis of Chemical Composition

1. Read the following statements and choose the set of correct statements (2022)

- A. Lecithin found in the plasma membrane is a glycolipid
- B. Saturated fatty acids possess one or more $C=C$ bonds
- C. Gingely oil has lower melting point, hence remains as oil in winter
- D. Lipids are generally insoluble in water but soluble in some organic solvents
- E. When fatty acid is esterified with glycerol, monoglycerides are formed

Choose the correct answer from the options given below.

- a. A, B and D only b. A, B and C only
- c. A, D and E only d. C, D and E only

2. Following are the statements with reference to 'lipids'.

- A. Lipids having only single bonds are called unsaturated fatty acids.
- B. Lecithin is a phospholipid.
- C. Trihydroxy propane is glycerol.
- D. Palmitic acid has 20 carbon atoms including carboxyl carbon.
- E. Arachidonic acid has 16 carbon atoms.

Choose the correct answer from the options given below. (2021)

- a. C & D only b. B & C only
- c. B & E only d. A & B only

3. Identify the basic amino acid from the following. (2020)

- a. Glutamic acid b. Lysine
- c. Valine d. Tyrosine

4. Identify the statement which is incorrect. (2020-Covid)

- a. Glycine is an example of lipids
- b. Lecithin contains phosphorus atom in its structure
- c. Tyrosine possesses aromatic ring in its structure
- d. Sulphur is an integral part of cysteine

5. A typical fat molecule is made up of: (2016 - I)

- a. Three glycerol molecules and one fatty acid molecule
- b. One glycerol and three fatty acid molecules
- c. One glycerol and one fatty acid molecule
- d. Three glycerol and three fatty acid molecules

6. A phosphoglyceride is always made up of: (2013)

- a. A saturated or unsaturated fatty acid esterified to a phosphate group which is also attached to a glycerol molecule
- b. Only a saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
- c. Only an unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
- d. A saturated or unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached

Primary & Secondary Metabolites

7. Identify the incorrect pair. (2021)

- a. Toxin - Abrin b. Lectins - Concanavalin A
- c. Drugs - Ricin d. Alkaloids - Codeine

8. Which of the following are not secondary metabolites in plants? (2021)

- a. Amino acids, glucose b. Vinblastin, curcumin
- c. Rubber, gums d. Morphine, codeine

9. Concanavalin A is (2019)

- a. An alkaloid b. An essential oil
- c. A lectin d. A pigment

Biomacromolecules, Proteins

10. Match List-I with List-II. (2022)

List-I (Biological Molecules)		List-II (Biological function)	
(A)	Glycogen	(i)	Hormone
(B)	Globulin	(ii)	Biocatalyst
(C)	Steroids	(iii)	Antibody
(D)	Thrombin	(iv)	Storage product

Choose the correct answer from the options given below.

- a. A-iv B-iii C-i D-ii
- b. A-iii B-ii C-iv D-i
- c. A-iv B-ii C-i D-iii
- d. A-ii B-iv C-iii D-i

11. Which one of the following is the most abundant protein in the animals? (2020)
 a. Collagen b. Lectin
 c. Insulin d. Haemoglobin
12. Which of the following glucose transporters is insulin-dependent? (2019)
 a. GLUT I b. GLUT II
 c. GLUT III d. GLUT IV
13. Which of the following are not polymeric? (2017-Delhi)
 a. Nucleic acids b. Proteins
 c. Polysaccharides d. Lipids
14. Which of the following is the least likely to be involved in stabilising the three-dimensional folding of most proteins? [OS] (2016 - II)
 a. Hydrophobic interaction b. Ester bonds
 c. Hydrogen bonds d. Electrostatic interaction

Polysaccharides, Nucleic Acids & Types of Bond

15. Exoskeleton of arthropods is composed of: (2022)
 a. Glucosamine b. Cutin
 c. Cellulose d. Chitin
16. Match List-I with List-II (2021)

List-I		List-II	
A.	Protein	(i)	C = C double bonds
B.	Unsaturated fatty acid	(ii)	Phosphodiester bonds
C.	Nucleic acid	(iii)	Glycosidic bonds
D.	Polysaccharide	(iv)	Peptide bonds

Choose the correct answer from the options given below.

- a. A-i B-iv C-iii D-ii
 b. A-ii B-i C-iv D-iii
 c. A-iv B-iii C-i D-ii
 d. A-iv B-i C-ii D-iii
17. Identify the substances having glycosidic bond and peptide bond, respectively in their structure: (2020)
 a. Glycerol, trypsin b. Cellulose, lecithin
 c. Inulin, insulin d. Chitin, cholesterol
18. Match the following: (2020-Covid)

1.	Aquaporin	(i)	Amide
2.	Asparagine	(ii)	Polysaccharide
3.	Abscisic acid	(iii)	Polypeptide
4.	Chitin	(iv)	Carotenoids

Select the correct option:

- (A) (B) (C) (D)
 a. (ii) (iii) (iv) (i)
 b. (ii) (i) (iv) (iii)
 c. (iii) (i) (ii) (iv)
 d. (iii) (i) (iv) (ii)

19. The two functional groups characteristic of sugars are: (2018)
 a. Hydroxyl and methyl b. Carbonyl and methyl
 c. Carbonyl and phosphate d. Carbonyl and hydroxyl
20. Which one of the following statements is wrong? (2016 - I)
 a. Sucrose is a disaccharide
 b. Cellulose is a polysaccharide
 c. Uracil is a pyrimidine
 d. Glycine is a sulphur containing amino acid
21. The chitinous exoskeleton of arthropods is formed by the polymerisation of: (2015 Re)
 a. D-glucosamine
 b. N-acetyl glucosamine
 c. Lipoglycans
 d. Keratin sulphate and chondroitin sulphate
22. Which of the following biomolecules does have phosphodiester bond? (2015 Re)
 a. Monosaccharides in polysaccharide
 b. Amino acids in a polypeptide
 c. Nucleic acids in a nucleotide
 d. Fatty acids in a diglyceride
23. Which one of the following is a non-reducing carbohydrate? (2014)
 a. Ribose 5-phosphate b. Maltose
 c. Sucrose d. Lactose

Enzymes

24. Match the following. Choose the correct option from the following: (2020)

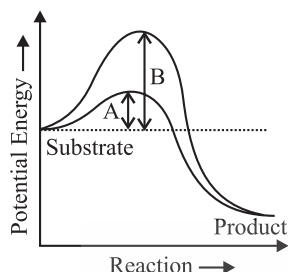
Column-I		Column-II	
1.	Inhibitor of catalytic activity	(i)	Ricin
2.	Possess peptide bonds	(ii)	Malonate
3.	Cell wall material in fungi	(iii)	Chitin
4.	Secondary metabolite	(iv)	Collagen

- (A) (B) (C) (D)
 a. (iii) (i) (iv) (ii)
 b. (iii) (iv) (i) (ii)
 c. (ii) (iii) (i) (iv)
 d. (ii) (iv) (iii) (i)
25. Consider the following statement :
 A. Coenzyme or metal ion that is tightly bound to enzyme protein is called prosthetic group.
 B. A complete catalytic active enzyme with its bound prosthetic group is called apoenzyme.
 Select the correct option. (2019)
 a. Both (A) and (B) are true.
 b. (A) is true but (B) is false.
 c. Both (A) and (B) are false.
 d. (A) is false but (B) is true.

26. Which one of the following statements is correct, with reference to enzymes? (2017-Delhi)

- Apoenzyme = Holoenzyme + Coenzyme
- Holoenzyme = Apoenzyme + Coenzyme
- Coenzyme = Apoenzyme + Holoenzyme
- Holoenzyme = Coenzyme + Cofactor

27. Which of the following describes the given graph correctly? (2016 - II)



- Endothermic reaction with energy A in absence of enzyme and B in presence of enzyme
- Exothermic reaction with energy A in absence of enzyme and B in presence of enzyme
- Endothermic reaction with energy A in presence of enzyme and B in absence of enzyme
- Exothermic reaction with energy A in presence of enzyme and B in absence of enzyme.

28. A non-proteinaceous enzyme is: (2016 - II)

- Ligase
- Deoxyribonuclease
- Lysozyme
- Ribozyme

29. Which one of the following statements is incorrect? (2015)

- The competitive inhibitor does not affect the rate of breakdown of the enzyme substrate complex
- The presence of the competitive inhibitor decreases the K_m of the enzyme for the substrate
- A competitive inhibitor reacts with the enzyme to form an enzyme inhibitor complex
- In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme

30. Select the option which is not correct with respect to enzyme action: (2014)

- Malonate is a competitive inhibitor of succinic dehydrogenase
- Substrate binds with enzyme at its active site
- Addition of lot of succinate does not reverse the inhibition of succinic dehydrogenase by malonate
- A non-competitive inhibitor binds the enzyme at a site distinct from that which binds the substrate

31. The essential chemical components of many coenzymes are: (2013)

- Vitamins
- Proteins
- Nucleic acids
- Carbohydrates

32. Transition state structure of the substrate formed during an enzymatic reaction is: (2013)

- Permanent and stable
- Transient but stable
- Permanent but unstable
- Transient and unstable

Answer Key

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
d	b	b	a	b	d	c	a	c	a	a	d	d	b	d	d	c
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
d	d	d	b	c	c	d	b	b	d	d	b	c	a	d		