Biomolecules

1. **Assertion (A):** We do not at the moment, understand the role or functions of all the secondary metabolite in host organisms.
Reason (R): Secondary metabolites arise from interaction of products of metabolic reactions.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

2. **Assertion (A):** Biomolecules which are found in the acid insoluble fraction are consider as macromolecules.
Reason (R): Biomolecules found in acid insoluble fraction have molecular weight more than 1000 Dalton.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

3. **Assertion (A):** Lipids whose molecular weight does not exceed 800 Dalton come under acid insoluble fraction.
Reason (R): Lipids are present not only as such but also arranged in structures like membranes during grinding these lipid form vesicle.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

4. **Assertion (A):** GLUT-4 is one of the essential protein for bioenergetics of the cell.
Reason (R): GLUT-4 enables glucose transport into cell.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

5. **Assertion (A):** Starch can be stained with iodine but cellulose can not be stained by iodine although both are homopolymer of glucose monomers.
Reason (R): Cellulose does not contain complex helices so can not hold iodine molecules.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

6. **Assertion (A):** Cellulose is a homopolymer, while chitin is a heteropolymer.
Reason (R): Cellulose is made up of identical monomers while chitin is made up of variable monomer units.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

7. **Assertion (A):** A nucleotide is an assemblage of three distinct components.
Reason (R): Nucleotide is made up of a heterocyclic compound, monosaccharide and nitrogenous base.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

8. **Assertion (A):** Adenine and Guanine are substituted purines.
Reason (R): In Adenine and Guanine purine heterocyclic ring has either amino or amino and oxy groups.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

9. **Assertion (A):** All living organisms from bacteria to human being show a dynamic state of body constituents.
Reason (R): Such dynamic state of body constituents keep maintain the level of energy and biochemicals required for livingness.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

10. **Assertion (A):** Living state is a non equilibrium steady state to be able to perform work.
Reason (R): Any system of equilibrium can not work and living organisms work continuously so they can not afford to reach equilibrium.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

11. **Assertion (A):** In enzyme catalysed reaction there is obligatory formation of an E-S complex.
Reason (R): Such complex formation is a transient phenomenon which leads to creation of transition state structure in which bond making/breaking is completed.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

12. **Assertion (A):** The activity of an enzyme can be affected by change in the conditions which can alter the tertiary structure of the protein.
Reason (R): Tertiary structure of protein helps in determination of structural specificity of an enzyme.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

13. **Assertion (A):** When inhibitor closely resembles the substrate in its molecular structure and inhibit the activity of the enzyme then it is known as competitive inhibitor.
Reason (R): Due to close structural similarity with the substrate the inhibitor compete with the substrate for active sites of enzymes.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

14. **Assertion (A):** Metal ions are important for functioning of cells.
Reason (R): Metal ions may act as co-factor for several enzymes.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

15. **Assertion (A):** Codon for methionine & tryptophan said to be degenerate.
Reason (R): Methionine and tryptophan amino acids coded by more than one codons.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

16. **Assertion (A):** Glucose is commonest sugar which provides energy on hydrolysis.
Reason (R): Glucose is the precursor of all the types of carbohydrates.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

17. **Assertion (A):** All monosaccharides are reducing sugar.
Reason (R): Monosaccharides contain free aldehyde or free ketonic group.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

18. **Assertion (A):** Cholesterole is an important biochemical.
Reason (R): Cholesterole is parental steroid it plays important role in the synthesis of other biologically active steroid hormones.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

19. **Assertion (A):** Constant diameter of DNA double helix is 20 Å.
Reason (R): Purines always pair with pyrimidines and vice-versa
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

20. **Assertion (A):** Sucrose is known as invert sugar.
Reason (R): Sucrose is a disaccharide.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

21. **Assertion (A):** All monosaccharide give Benedict's test.
Reason (R): All monosaccharide contain free aldehyde or ketonic group.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

22. **Assertion (A):** Amino acids are interliked by hydrogen bonds to form secondary structure in a polypeptide chain.
Reason (R): Beta pleated sheet and alpha helices are secondary structures shown by polypeptide chain.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

23. **Assertion (A): Enzymes** have active sites and substrates has reactive sites, on their surfaces respectively.
Reason (R): Active and reactive sites push the enzyme and substrate molecules away from each other.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

24. **Assertion (A):** Enzymes are defined as biological proteins.
Reason (R): Chemically all enzymes are globular proteins (with few exceptions).
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

25. **Assertion (A):** Water accounts for about 80 to 90% of a plant cell's expansion.
Reason (R): Enzymes are active in hydrated medium only.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

26. **Assertion (A):** Deoxyribose, $C_5H_{10}O_4$ is not exactly hydrate of carbon.
REASON (R): Carbohydrates are hydrates of carbon so compounds which follow Cx (H_2O)Y formula are carbohydrates.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

27. **Assertion (A):** All the polysaccharides are homopolymers.
Reason (R): All the polysaccharides contain repeating units of glucose.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

28. **Assertion (A):** In solutions of different pH, the structure of amino acids changes.
Reason (R): A particular property of amino acids is the ionizable nature of $-NH_2$ and $-COOH$ groups.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

29. **Assertion (A):** Dietary proteins are the source of essential amino acids.
Reason (R): Amino acids are organic compounds containing an amino group and an acidic group as substituents on the same carbon.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

30. **Assertion (A):** Lipids separate in the macromolecular fraction of a cell.
Reason (R): Lipids are associated with membranes in a cell.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

31. **Assertion (A):** Enzyme catalysed reactions proceed at rates vastly higher than that of uncatalysed ones.
Reason (R): Enzymes require an optimum temperature and optimum pH to work efficiently.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

32. **Assertion (A):** The starch-I2 is blue in colour.
Reason (R): Starch forms helical secondary structures and can hold I2 molecules in the helical portion.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

33. **Assertion (A):** With the increase in substrate concentration, the velocity of the enzymatic reaction rises at first but ultimately reaches a maximum velocity which is not exceeded by any further rise in concentration of the substrate.
Reason (R): The enzyme molecules are fewer than the substrate molecules and after saturation of these molecules, there are no free enzyme molecules to bind with the additional substrate molecules.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

34. **Assertion (A):** Dietary proteins are the source of essential amino acids.
Reason (R): All essential amino acids are aromatic. In the light of the above statements choose the correct answer from the options given below:
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

Directions: In the following questions, a statement of assertion is followed by a statement of reason.
Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

35. **Assertion:** Human diet should compulsorily contain glycine, serine and tyrosine.
Reason : Essential amino acids can not be synthesized in the human body.

36. **Assertion :** The amino acid glycine comes under the category of nonessential amino acids.
Reason : This is due to the fact that it can not be synthesised in the body.

37. **Assertion :** Unsaturated fats are more reactive compared with the saturated fats.
Reason : Unsaturated fats have only single bonds in their structure.

38. **Assertion:** Palmitic acid has 20 carbon atoms including carboxyl carbon.
Reason : Arachidonic acid has 16 carbon atoms including carboxyl carbon.

39. **Assertion :** Glycosidic bonds are formed by dehydration.
Reason : In polysaccharides, individual monosaccharide is linked by glycosidic bond.

40. **Assertion :** In a DNA molecule, A–T rich parts melt before G–C rich parts.
Reason: In between A and T, there are three H–bond, whereas in between G and C, there are two H-bonds.

41. **Assertion :** Allosteric enzymes show feed back inhibition.
Reason : The inhibitor is competitive.

42. **Assertion:** Hydrolases are the enzymes which catalyse the hydrolysis of ester, ether, peptide, glycosidic, C – C or P – N etc. bonds.
Reason: Lyases are the enzymes catalysing the linking together of 2 compounds like joining of C – O, C – N, P – O etc. bonds.

43. **Assertion:** The protein part of the enzyme is called apoenzyme and non-protein part of the enzyme is called co-factor.
Reason : Zinc is a co-factor for the proteolytic enzyme carboxypeptidase.

44. **Assertion:** Amino acids are known as α-amino acids.
Reason: Amino acids are organic compounds containing an amino group and carboxylic group as substituent on the α-carbon.

45. **Assertion:** Enzyme substrate complex does not remain throughout the reaction.
Reason: The greater the affinity of the enzyme for a substrate, the higher is the catalytic activity.

46. **Assertion:** Desmolysing enzymes are those which catalyse the reactions by hydrolysis.
Reason: Digestive enzymes are hydrolysing in nature.

47. **Assertion:** All enzymes are not proteins.
Reason: RNA molecules that possess catalytic activity are called ribozymes.

48. **Assertion:** Inorganic catalysts work efficiently at high temperature.
Reason : Enzymes get damaged at high temperature.

ANSWER KEY																			
Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	2	1	1	1	1	4	3	1	1	1	1	3	1	1	4	4	1	1	1	2
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**						
Ans.	1	2	3	1	1	1	4	1	2	2	2	1	1	3						

35.	36.	37.	38.	39.	40.	41.	42.	43.	44.	45.	46.	47.	48.
d	c	c	d	b	c	c	c	b	a	a	b	a	a