Biomolecules

 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.

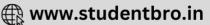
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false
- resembles the substrate in its molecular structure and inhibit the 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 cofactor 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.

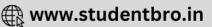
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false
- **21. Assertion (A):** All monosaccharide give Benedict's test.

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, C₅H₁₀O₄ is not exactly hydrate of carbon.

REASON (R): Carbohydrates are hydrates of carbon so compounds which follow Cx (H2O)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

Reason (R): A particular property of amino acids is the ionizable nature of -NH2 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.

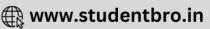
Reason (R): The enzyme molecules are fewer than the substrate molecules and after saturation of these molecules, there are no free enzyme molecules to bind with the additional substrate molecules.

- (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

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	С	С	С	b	a	a	ь	a	a

