

Biomolecules — CBSE Pattern Test 2

Class 11 Biology · 90 minutes · 40 marks · Sections A–D with answer key · Narayan Gurukul Academy

Test 2 — CBSE Pattern (90 minutes, 40 marks)

Class 11 Biology · Biomolecules · Narayan Gurukul Academy (ClassApna)

General Instructions: (1) This paper has four sections — Section A (1×10), Section B (2×4), Section C (3×4) and Section D (5×2) — total 40 marks. Time allowed: 90 minutes.

(2) All questions are compulsory. No overall choice is given; internal choice, where allowed, is clearly marked.

(3) For MCQ questions choose the single correct option; for VSA answers write a single line.

(4) Take $g = 10 \text{ m/s}^2$. All symbols carry their usual meaning. Use of a calculator is not permitted.

Section A — MCQ & VSA ($10 \times 1 = 10$ marks)

- Micromolecules include
 - amino acids and sugars
 - proteins
 - nucleic acids
 - polysaccharides
- The peptide bond is formed between
 - the carboxyl group of one amino acid and the amino group of another
 - two carboxyl groups
 - two amino groups
 - a sugar and a base
- The storage carbohydrate of animals is
 - glycogen
 - starch
 - cellulose
 - sucrose
- RNA contains the sugar
 - ribose
 - deoxyribose
 - glucose
 - maltose
- Phospholipids are the main components of
 - cell membranes
 - cell walls
 - enzymes
 - nucleic acids
- The active site of an enzyme is
 - a specific region that binds the substrate
 - the whole enzyme
 - a cofactor
 - a product
- The breakdown reactions of metabolism are
 - catabolic

- (B) anabolic
 - (C) neutral
 - (D) reversible
8. The secondary structure of a protein is
- (A) the alpha-helix or beta-sheet
 - (B) the linear sequence of amino acids
 - (C) the three-dimensional shape
 - (D) the joined subunits
9. What are macromolecules?
10. What is the primary structure of a protein?

Section B — Short Answer I ($4 \times 2 = 8$ marks)

11. What is a polysaccharide?
12. What are phospholipids?
13. What is an active site?
14. What is catabolism?

Section C — Short Answer II ($4 \times 3 = 12$ marks)

15. State the role of water in living organisms.
16. State two functions of proteins.
17. State two functions of nucleic acids.
18. Distinguish between a cofactor and a coenzyme.

Section D — Long Answers ($2 \times 5 = 10$ marks)

19. (a) Explain the structure and functions of polysaccharides. (b) Describe the classification of lipids.
20. (a) Describe the factors affecting enzyme activity. (b) Distinguish between catabolism and anabolism with examples.

Answer Key (Marking Scheme)

- Q1 — (A) amino acids and sugars. Q2 — (A) the carboxyl group of one amino acid and the amino group of another. Q3 — (A) glycogen. Q4 — (A) ribose. Q5 — (A) cell membranes. Q6 — (A) a specific region that binds the substrate. Q7 — (A) catabolic. Q8 — (A) the alpha-helix or beta-sheet.
- Q9 — Biomolecules with a molecular weight above 1000 Da (proteins, nucleic acids, polysaccharides).
- Q10 — The linear sequence of amino acids in a protein.
- Q11 — A polysaccharide is a polymer of monosaccharides.
- Q12 — Phospholipids are lipids with a phosphate group, forming cell membranes.
- Q13 — The active site is the specific region of an enzyme that binds the substrate.
- Q14 — Catabolism is the breakdown of complex molecules releasing energy.
- Q15 — Water acts as a solvent, a transport medium and a temperature buffer.
- Q16 — Proteins act as enzymes and as structural components.
- Q17 — Storage/transmission of genetic information and protein synthesis.
- Q18 — A cofactor is a non-protein helper (metal ion); a coenzyme is an organic cofactor (e.g. NAD).

Q19 — (a) Storage (starch, glycogen) and structural (cellulose, chitin). (b) Simple lipids (fats, oils), compound lipids (phospholipids) and derived lipids (steroids).

Q20 — (a) Temperature and pH (and substrate/enzyme concentration); activity is maximal at an optimum. (b) Catabolism breaks down (respiration); anabolism builds up (photosynthesis).