

Biomolecules — CBSE Pattern Test 1

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

Test 1 — 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)

1. The most abundant element in living organisms is

- (A) carbon
- (B) nitrogen
- (C) calcium
- (D) iron

2. Proteins are polymers of

- (A) amino acids
- (B) monosaccharides
- (C) nucleotides
- (D) fatty acids

3. The storage carbohydrate of plants is

- (A) starch
- (B) glycogen
- (C) cellulose
- (D) chitin

4. DNA contains the sugar

- (A) deoxyribose
- (B) ribose
- (C) glucose
- (D) fructose

5. Lipids are generally

- (A) insoluble in water
- (B) soluble in water
- (C) polymers of amino acids
- (D) nitrogenous

6. Enzymes are chemically

- (A) proteins
- (B) carbohydrates
- (C) lipids
- (D) nucleic acids

7. The sum total of all chemical reactions in a cell is

- (A) metabolism

- (B) anabolism only
 - (C) catabolism only
 - (D) catalysis
8. The building blocks of lipids are
- (A) fatty acids and glycerol
 - (B) amino acids
 - (C) nucleotides
 - (D) monosaccharides
9. What is a peptide bond?
10. What is a nucleotide?

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

11. What are micromolecules?
12. Name one essential amino acid.
13. Name the storage carbohydrate of animals.
14. What are enzymes?

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

15. Distinguish between essential and non-essential amino acids.
16. Distinguish between starch and cellulose.
17. Distinguish between DNA and RNA.
18. State two properties of enzymes.

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

19. (a) Describe the four levels of protein structure. (b) Describe the structure of DNA.
20. (a) Explain the mechanism of enzyme action. (b) Explain the concept of metabolism with examples.

Answer Key (Marking Scheme)

- Q1 — (A) carbon. Q2 — (A) amino acids. Q3 — (A) starch. Q4 — (A) deoxyribose. Q5 — (A) insoluble in water. Q6 — (A) proteins. Q7 — (A) metabolism. Q8 — (A) fatty acids and glycerol.
- Q9 — A peptide bond is the bond formed between the carboxyl group of one amino acid and the amino group of another.
- Q10 — A nucleotide consists of a sugar, a phosphate and a nitrogenous base.
- Q11 — Biomolecules with a molecular weight below 1000 Da (water, salts, sugars, amino acids).
- Q12 — Lysine (or valine, leucine).
- Q13 — Glycogen.
- Q14 — Enzymes are biological catalysts, chemically proteins.
- Q15 — Essential amino acids cannot be synthesised by the body; non-essential ones can.
- Q16 — Starch is a branched storage polysaccharide of plants; cellulose is an unbranched structural polysaccharide of plant cell walls.
- Q17 — DNA has deoxyribose, thymine and is double-stranded; RNA has ribose, uracil and is single-stranded.

Q18 — Enzymes are highly specific and lower the activation energy of a reaction.

Q19 — (a) Primary (sequence), secondary (α -helix/ β -sheet), tertiary (3-D shape), quaternary (subunits). (b) A double helix of two antiparallel strands with A–T and G–C base pairing.

Q20 — (a) The substrate binds the active site forming an enzyme–substrate complex that converts to product (lock-and-key / induced-fit). (b) Metabolism = anabolism (synthesis, e.g. photosynthesis) + catabolism (breakdown, e.g. respiration).