



Attempt questions first; check the separate key afterward. Use labelled diagrams where asked. Give scientific reasons; answer key covers closed questions.

A. Very short answers - 1 mark each

1. Name the monomers of proteins.
2. Name the sugar in RNA.
3. Name the nitrogenous base present in RNA instead of thymine.
4. Name the animal storage polysaccharide.
5. Name the major plant cell-wall polysaccharide.
6. Are all enzymes proteins?
7. Name the protein part of a conjugated enzyme.
8. What is a cofactor?

B. Short answers / practice - 2 marks each

9. Distinguish micromolecules and macromolecules in cellular extracts.
10. Why are lipids found in the acid-insoluble fraction despite low molecular masses?
11. Compare starch, glycogen and cellulose.
12. Describe the general structure of an amino acid.
13. Classify amino acids by acidic, basic and neutral side-chain character.
14. Distinguish saturated and unsaturated fatty acids.
15. Explain why phospholipids are suitable membrane components.
16. Compare nucleosides and nucleotides.
17. Differentiate DNA and RNA in sugar, bases and usual structure.
18. Describe primary, secondary, tertiary and quaternary protein structure.
19. Explain protein denaturation and its effects on function.
20. Describe the active site of an enzyme.

C. Application / reasoning - 3 marks each

21. Does an enzyme alter the equilibrium constant of a reaction?
22. Explain how enzymes lower activation energy.
23. Why does enzyme activity vary with temperature?
24. Explain the influence of pH on enzyme activity.
25. Describe the relation between substrate concentration and reaction rate.
26. Differentiate competitive inhibition from reduced enzyme concentration.
27. Name the inhibitor competing with succinate for succinate dehydrogenase.
28. Compare coenzymes, prosthetic groups and metal-ion cofactors.
29. A protein has four polypeptide subunits. Which structural level describes their arrangement?
30. Can denaturation occur without breaking the protein's primary sequence?
31. Explain why enzyme specificity matters in cellular chemistry.

D. Extended practice - 5 marks each

32. Draw and explain an enzyme-catalysed reaction-energy profile.
33. Compare carbohydrates, proteins, lipids and nucleic acids in composition and functions.
34. Explain enzyme action and the effects of temperature, pH, substrate concentration and inhibitors.
35. Describe protein structural levels with examples and explain how structure controls function.

ANSWER KEY - Numerical / closed questions

- 1) Amino acids. 2) Ribose. 3) Uracil. 4) Glycogen. 5) Cellulose. 6) No; some RNA molecules are catalytic. 7) Apoenzyme. 8) Non-protein component needed for enzyme activity. 21) No. 27) Malonate. 29) Quaternary. 30) Yes.