



Attempt questions first; check the separate key afterward. Show all working. Draw accurate figures where required.

A. Very short answers - 1 mark each

1. Name the basic structural and functional unit of living organisms.
2. State the main ideas of cell theory.
3. Which cell structure controls entry and exit of substances?
4. Explain selective permeability.
5. What outer covering gives plant cells additional rigidity?
6. Compare cell wall and cell membrane.
7. Name the organelle usually containing most eukaryotic DNA.
8. Explain the roles of DNA and chromosomes.

B. Short answers / practice - 2 marks each

9. Name the organelle chiefly associated with aerobic ATP production.
10. Why do metabolically active cells often contain many mitochondria?
11. Which organelle carries out photosynthesis?
12. Compare plant and animal cells using a labelled diagram.
13. Where are proteins synthesised?
14. Distinguish rough and smooth endoplasmic reticulum.
15. Name the organelle that modifies and packages proteins.
16. Explain how ER, Golgi and vesicles cooperate.
17. Does a prokaryotic cell have a membrane-bound nucleus?
18. Compare prokaryotic and eukaryotic cells.
19. What is osmosis?
20. Predict what happens to a plant cell in a strongly hypertonic solution.

C. Application / reasoning - 3 marks each

21. A microscope has 10× eyepiece and 40× objective. Find total magnification.

22. Explain why magnification alone does not guarantee clear detail.

23. Which cell division normally produces two genetically similar daughter cells?

24. Contrast its purpose with meiosis.

25. A diploid cell has 24 chromosomes. How many are normally in each gamete after meiosis?

26. How many are in each daughter cell after mitosis?

27. Name the organelle containing digestive enzymes that break down worn-out cell components.

28. Explain why a plant cell in pure water usually does not burst like an unprotected animal cell may.

29. A microscope combines a 15× eyepiece and 40× objective. Find magnification.

30. A parent cell has 16 chromosomes. How many are expected in each daughter after mitosis?

31. Compare diffusion and osmosis, stating the role of a selectively permeable membrane.

D. Extended practice - 5 marks per pair

32. Name four major classes of biological macromolecules.

33. State one major function of each.

34. Does an onion epidermal cell generally contain chloroplasts?

35. Describe preparation and observation of an onion-peel mount, including staining, precautions and labelled observations.

ANSWER KEY - Numerical / closed questions

- 1) Cell. 3) Plasma membrane. 5) Cell wall. 7) Nucleus. 9) Mitochondrion. 11) Chloroplast. 13) Ribosomes. 15) Golgi apparatus. 17) No. 20) Water leaves; plasmolysis may occur. 21) 400×. 23) Mitosis. 25) 12. 26) 24. 27) Lysosome. 29) 600×. 30) 16. 32) Carbohydrates, proteins, lipids, nucleic acids. 34) No.