



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. Who stated that cells arise from pre-existing cells?
2. Name the prokaryotic DNA-containing region.
3. State the usual bacterial ribosome type.
4. Name the organelle chiefly modifying and packaging proteins.
5. Name the organelle containing hydrolytic enzymes.
6. What is the membrane around a vacuole called?
7. Name the fluid matrix inside a chloroplast.
8. Are mitochondria part of the endomembrane system?

B. Short answers / practice - 2 marks each

9. State the main postulates of cell theory.
10. Compare prokaryotic and eukaryotic cells.
11. Explain glycocalyx, cell wall and plasma membrane in bacteria.
12. Differentiate Gram-positive and Gram-negative cell envelopes at a basic level.
13. Describe the fluid-mosaic model of the plasma membrane.
14. Compare passive diffusion and active transport.
15. Explain the functions of plant cell walls and plasmodesmata.
16. Compare smooth and rough endoplasmic reticulum.
17. Describe cis and trans faces of the Golgi apparatus.
18. Explain why lysosomes need an acidic internal environment.
19. Describe the structure and functions of vacuoles.

20. Compare mitochondria and chloroplasts as semiautonomous organelles.

C. Application / reasoning - 3 marks each

21. Name the membrane folds inside mitochondria.
22. Name the chloroplast stacks of thylakoids.
23. State the components of a typical 80S ribosome.
24. Explain why sedimentation coefficients are not arithmetically additive.
25. Compare chromoplasts, chloroplasts and leucoplasts.
26. Describe the components and roles of the cytoskeleton.
27. State the usual axonemal arrangement of eukaryotic cilia.
28. State the usual centriole microtubule arrangement.
29. Explain nuclear envelope, nuclear pores and nucleolus.
30. Distinguish chromatin from a condensed chromosome.
31. Classify chromosomes by centromere position.

D. Extended practice - 5 marks each

32. Draw a labelled animal cell and explain five organelles.
33. Draw a labelled chloroplast and mitochondrion and compare compartmentalisation.
34. Describe ciliary ultrastructure and relate it to movement.
35. Trace synthesis and export of a secreted protein through the endomembrane system.

ANSWER KEY - Numerical / closed questions

- 1) Rudolf Virchow. 2) Nucleoid. 3) 70S. 4) Golgi apparatus. 5) Lysosome. 6) Tonoplast. 7) Stroma. 8) No. 21) Cristae. 22) Grana. 23) 60S and 40S subunits. 27) 9+2 microtubules. 28) Nine peripheral triplets.