Topic 1 - Cell Biology - AQA Biology GCSE

Exam Questions/Mock Exam Questions

Questions For Foundation, Higher, and Triple Science (scroll down for questions for higher and triple science only):
(It would still be recommended to answer the foundation tier questions for triple science and higher tier to ensure you have good understanding).

Q1. A student uses a microscope to look at an onion cell.

(a) Name two parts of a plant cell that are not found in animal cells.

_____

_____

(2)

(b) What is the function of the nucleus in a cell?

_____

(1)

[Total: 3 marks]

Q2. Scientists grow bacteria in the lab.

(a) Name the type of cell that bacteria have.

_____

(1)

(b) Give two structures found in a bacterial cell.

_____

_____

(2)
[Total: 3 marks]

Q3. A student investigates how fast substances move by diffusion.
(a) What is diffusion?

(2)

(b) Give one factor that affects the rate of diffusion.

(1)

[Total: 3 marks]

Q4. Plant roots absorb water by osmosis.
(a) What is osmosis?

(2)

(b) Describe what happens to a plant cell in a very salty solution.

(2)

[Total: 4 marks]

Q5.

(a) Which type of microscope allows you to see smaller structures inside cells?

(1)

(b) Why is a scale bar useful in a microscope image?

(1)

(c) A cell is 0.05 mm long. Convert this into micrometres (μm).

(2)
[Total: 4 marks]

Q6. The human body contains specialised cells.

(a) What is a specialised cell?

(1)
(b) Give two examples of specialised cells in animals and explain their adaptations.

(2)

[Total: 3 marks]

Q7. Stem cells can be found in embryos and adults.

(a) What is a stem cell?

_____

(1)

(b) Suggest one medical use of stem cells.

_____

(1)

(c) Give one ethical issue linked to the use of embryonic stem cells.

_____

_____

(1)
[Total: 3 marks]

Q8. Substances move into and out of cells.

(a) What type of transport uses energy to move substances against a concentration gradient?

_____

(1)

(b) Name one part of the human body where this type of transport happens.

_____

(1)
[Total: 2 marks]

Q9. A student prepares a slide of cheek cells.
(a) Why do we use a stain like iodine when observing cells?

(1)

(b) Name two structures you would see in a cheek cell under a light microscope.

(2)
[Total: 3 marks]

Q10. Cells divide by a process called mitosis.

(a) What is the purpose of mitosis?

(1)

(b) Name one place in the human body where mitosis happens.

(1)

(c) Describe what happens to the genetic material during mitosis.

(2)
[Total: 4 marks]

Q11. A student looks at a diagram of a root hair cell.

(a) What is the function of a root hair cell?

_____

(1)

(b) Explain how its shape helps its function.

_____

_____

(2)
[Total: 3 marks]

Q12. A scientist observes a bacterial colony growing on agar jelly.

(a) Describe how to safely grow bacteria in the school laboratory. Give one safety rule.

_____

(1)

(b) Why is the petri dish stored upside down in the incubator?

_____

(1)

(c) State the maximum temperature used to grow cultures in schools.

_____

(1)
[Total: 3 marks]

Q13. Mitochondria are found in large numbers in muscle cells.

(a) What is the function of mitochondria?

_____

(1)

(b) Explain why muscle cells have many mitochondria.

_____

_____

(2)
[Total: 3 marks]

Q14. Plant and animal cells share some features.

(a) Name three structures found in both plant and animal cells.

_____

_____

_____

(3)
[Total: 3 marks]

Q15. A student calculates the magnification of a microscope image.

(a) State the formula for magnification.

_____

(1)

(b) The image size is 2 mm and the real size is 0.02 mm. Calculate the magnification.

(2)
[Total: 3 marks]

Q16. A student compares prokaryotic and eukaryotic cells.

(a) State one difference between prokaryotic and eukaryotic cells.

(1)

(b) Which type of cell has a nucleus?

(1)
[Total: 2 marks]

Q17. A red blood cell has no nucleus.

(a) Suggest why a red blood cell does not need a nucleus.

(2)

(b) What is the main function of red blood cells?

(1)
[Total: 3 marks]

Q18. The diagram shows a sperm cell.

(a) State one adaptation of a sperm cell and how it helps the cell function.

(2)
[Total: 2 marks]

Q19. A student investigates the effect of concentration on osmosis in potato cylinders.

(a) What would happen to the mass of a potato cylinder placed in a concentrated sugar solution?

(2)

(b) Why is it important to blot dry the potato before weighing it?

(1)
[Total: 3 marks]

Higher Tier Questions

Q20. A student observes a plant cell using a light microscope.

(a) Name the part of the cell where photosynthesis takes place.

(1)

(b) Describe how the structure of a palisade cell helps it carry out photosynthesis.

(2)
[Total: 3 marks]

Q21. A researcher investigates the rate of diffusion in different temperatures. (a) What is meant by diffusion?

(2)

(b) Explain how temperature affects the rate of diffusion.

(2)

[Total: 4 marks]

Q22. The diagram shows an animal cell during cell division.

(a) Name the process by which cells divide to produce identical daughter cells.

(1)

(b) Describe what happens to the chromosomes during this process.

(2)

(c) Why is this type of cell division important in multicellular organisms?

(2)

[Total: 5 marks]

Q23. Scientists use electron microscopes to study cells.

(a) State one advantage of using an electron microscope over a light microscope.

(1)

(b) Give one reason why electron microscopes are not used in schools.

(1)

[Total: 2 marks]

Q24. A student investigates osmosis in potatoes. (a) Describe a method to investigate how different concentrations of sugar solution affect the mass of potato cylinders.

(4)

(b) State one variable that should be controlled in this experiment.

(1)

[Total: 5 marks]

Q25. Stem cells are used in medicine.

(a) Describe the difference between embryonic and adult stem cells.

(2)

(b) Suggest two potential uses of stem cells in medicine.

(2)

(c) Give one argument against the use of embryonic stem cells.

(2)

[Total: 6 marks]

Q26. A student is asked to calculate magnification. (a) State the equation to calculate magnification.

(1)

(b) An image measures 5 mm and the actual size of the object is 0.05 mm. Calculate the magnification.

(2)

[Total: 3 marks]

Q27. A diagram shows the internal structure of a bacterial cell.

(a) Name two structures found in bacterial cells that are not found in animal cells.

(2)

(b) Name the type of cell a bacterium is.

(1)

[Total: 3 marks]

Q28.

(a) Explain how the structure of a nerve cell is related to its function.

(3)

[Total: 3 marks]

Q29. A red blood cell has no nucleus.

(a) Explain how this adaptation helps the red blood cell carry out its function.

(2)

(b) Describe the function of red blood cells.

(2)

[Total: 4 marks]

Q30. (a) Describe the process of mitosis. Include the changes to chromosomes.

(6)

[Total: 6 marks]

Q31. The human digestive system contains many specialised cells. (a) State the function of a goblet cell in the small intestine.

(1)

(b) Explain why the cells lining the small intestine have many mitochondria.

(2)

[Total: 3 marks]

Q32. A diagram shows a sperm cell. (a) Describe how the tail and mitochondria help the sperm cell carry out its function.

(2)

(b) What is the role of the acrosome in the sperm cell?

(1)

[Total: 3 marks]

Q33. A student investigates osmosis using a potato and sugar solutions.

(a) What would happen to a potato cylinder in a solution with a higher water concentration than inside the potato?

(2)

(b) Why should the student repeat the experiment three times?

(1)

[Total: 3 marks]

Q34. A scientist measures the surface area to volume ratio of different cells.

(a) Explain why single-celled organisms can rely on diffusion alone.

(2)

(b) Why do multicellular organisms need transport systems?

(2)

[Total: 4 marks]

Q35. A diagram shows a chloroplast.

(a) What is the main function of a chloroplast?

(1)

(b) Describe the role of chlorophyll inside the chloroplast.

(2)

[Total: 3 marks]

Q36. (a) Describe how to prepare a slide of onion cells and view them under a microscope. Include safety precautions.

(6)

[Total: 6 marks]

Triple Science Tier Questions

Q37.
(a) Name the part of the cell where photosynthesis occurs.

(1)

(b) Explain how the structure of the chloroplast is related to its function.

(2)

(c) Describe the role of the cell wall in plant cells.

(2)

[Total: 5 marks]

Q38. Bacteria are prokaryotic cells.

(a) State two differences between prokaryotic and eukaryotic cells.

(2)

(b) Describe the function of the plasmid in bacterial cells.

(1)

(c) Explain why bacteria can reproduce quickly.

(2)

[Total: 5 marks]

Q39. A student investigates the process of diffusion.

(a) Define diffusion.

(2)

(b) Describe how surface area to volume ratio affects the rate of diffusion in cells.

(2)

(c) Explain why large organisms need specialised exchange surfaces.

(2)

[Total: 6 marks]

Q40. The nucleus controls many cell activities.
(a) Describe the role of the nucleus in a cell.

(1)

(b) Explain how the nucleus controls protein synthesis.

(3)

[Total: 4 marks]

Q41. Osmosis is important in plant cells.
(a) Define osmosis.

(2)

(b) Predict what will happen to a plant cell placed in a concentrated salt solution. Explain your answer.

(3)

[Total: 5 marks]

Q42. A student examines different types of microscopes.
(a) Compare light microscopes and electron microscopes in terms of resolution and magnification.

(3)

(b) Suggest one reason why electron microscopes are not commonly used in schools.

(1)

[Total: 4 marks]

Q43. The process of mitosis is important for growth and repair.
(a) Describe what happens to the chromosomes during mitosis.

(3)

(b) Explain why mitosis is important in multicellular organisms.

(2)

[Total: 5 marks]

Q44. Stem cells can develop into different types of cells.
(a) Describe the difference between embryonic and adult stem cells.

(2)

(b) Explain two potential uses of stem cells in medicine.

(4)

[Total: 6 marks]

Q45. A diagram shows a nerve cell.
(a) Describe two adaptations of a nerve cell that help it transmit impulses quickly.

(3)

(b) Explain how the structure of the axon is related to its function.

(2)

[Total: 5 marks]

Q46. The mitochondria are known as the “powerhouse” of the cell.
(a) Explain the function of mitochondria.

(1)

(b) Describe why muscle cells contain many mitochondria.

(3)

[Total: 4 marks]

Q47. Red blood cells have adaptations for their function.
(a) Name two adaptations of red blood cells.

(2)

(b) Explain how these adaptations help red blood cells carry oxygen.

(3)

[Total: 5 marks]

Q48. The process of active transport is important in cells.
(a) Define active transport.

(1)

(b) Describe one example of active transport in the human body.

(2)

(c) Explain why active transport requires energy.

(2)

[Total: 5 marks]

Q49. The surface area to volume ratio affects cell transport.
(a) Calculate the surface area to volume ratio of a cube-shaped cell with sides of 2 μm. Show your working.

(3)

(b) Explain why cells are small based on the surface area to volume ratio.

(2)

[Total: 5 marks]

Q50. A student studies specialised cells in plants.
(a) Describe the structure and function of xylem vessels.

(3)

(b) Describe the structure and function of phloem tubes.

(3)

[Total: 6 marks]

Q51. A student prepares a slide of onion cells.
(a) Describe how to prepare the slide safely.

(3)

(b) Explain why a stain is used when observing cells under a microscope.

(2)

[Total: 5 marks]