

## **BIOLOGY 1: Molecules to Organs**

Time allowed: 1.5 hours (90 minutes)

**Answer three questions**

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1. Explain the reasons why the stomata of a cactus plant open at different times of day to those of a cabbage?
  3. Is a virus alive? Justify your answer.
  4. Why do some mutations to DNA matter more than others?
  5. Using examples, explain why lipid-based membranes are essential for all eukaryotic organisms.
  6. List the specific body tissue types that form part of the endocrine system and that release hormones. Provide one specific example that illustrates how hormone(s) regulate the body function of your choice.
  7. Explain how an enzyme extracted from a thermophilic bacterium is used together with other reagents to perform a Polymerase Chain Reaction.
  8. Describe the metabolic steps involved in the conversion of a glucose molecule to CO<sub>2</sub>.
  9. Using diagrams where necessary, explain what happens during 'double fertilization' in plants.
  10. Describe how a cell converts sequence information contained in its DNA to build a protein.
  11. Compare and contrast the structure of chromosomes in eukaryotic and prokaryotic organisms.
  12. What is the difference between a sporophytic and a gametophytic cell? Give examples of both cell types in a human and explain the mechanisms that allow the cells of one type to become the other.
  13. What are the main categories of enzyme inhibitor? Illustrate how different inhibitor types effects alter an enzyme's rate of reaction. Provide specific examples of how enzyme inhibitors have been used in medicines and also used as poisons.

14. Name the organelles found in a typical animal cell and briefly outline the function of each. Describe which organelles in a plant cell are different. Can you name any cell types that lack a particular organelle?
15. How do muscles work?
16. Describe the main pathway that allows plants to remove Carbon dioxide from the atmosphere. Are you aware of any variations on this pathway that are more efficient at carbon dioxide removal?
17. Describe how blood circulates around the human body.
18. Describe the structure and functioning of kidneys.

**END**