

BIOLOGY 1: Molecules to Organs

Time Allowed – 1.5 hours

3 questions should be attempted

1. Why in biological terms is smoking cigarettes such a bad idea?
2. Explain what will happen to your next meal once it is inside your digestive system.
3. What is 'ATP' and why is it so central in biology?
4. What are the two types of transport systems found in plants and how do they function?
5. Discuss the structure and roles of biological membranes.
6. Describe the mammalian circulatory system.
7. What types of pathogens cause disease in humans and what defences does our body have?
8. Write a biological essay on any aspect of 'reproduction' of your own choice.
9. Where are polysaccharides found in nature, and what types of structures do they have?
10. List with descriptions the organelles that can be found in cells. Are there any cell types missing particular organelles?
11. How do 'genes' create 'phenotypes'?
12. Imagine you are in a supermarket 'fruit and vegetables' section. Pick out some of the items, and say what they are in botanical terms.
13. Describe adaptations for oxygen uptake in some non-mammalian organisms (e.g., earthworm, insect, fish, frog, bird).
14. What regulates 'homeostasis' in our bodies?
15. Outline the basics of microbiology.
16. How do nerves work?
17. A paper in the journal *Science* in 2010 estimated that the yearly 'gross carbon dioxide uptake' by global terrestrial vegetation was about 123 billion tonnes. Outline the biology of this process in a plant, and explain what was meant by 'gross'.
18. Present a real or imaginary scientific experiment in the format of a scientific report ('Introduction', 'Materials and Methods', 'Results', and 'Discussion').