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|  | **Entrance Examination**  **May 2021** |
| **BIOLOGY 1: MOLECULES TO ORGANS**  Time allowed: 1.5 hours (90 minutes)  **THREE questions should be attempted** | |

1. In 1816, when the nature of life was still mysterious, William Lawrence, Professor at the Royal College of Surgeons, observed that living beings “all have participated in the existence of other living beings . . . life has its origin in that of the parents”. Discuss what we now know about how life is inherited.
2. Review the organization and reproduction of eukaryotic and prokaryotic cells.
3. The rate of solar energy capture by global photosynthesis is about six times the power consumption of the planet’s human [population](http://en.wikipedia.org/wiki/World_energy_resources_and_consumption). Describe some of the biochemical and cellular details of photosynthesis.
4. What is ‘ATP’ and why is it so central in biology?
5. Where are polysaccharides found in nature, and what types of structures do they have?
6. Give some examples of enzymes and discuss their function and properties.
7. Write an essay on the biological importance of water.
8. If Climate Change is due to increased CO2 in the Earth's atmosphere, shouldn’t this make plants grow faster?
9. What are the two types of transport systems found in plants and how do they function?
10. Outline the structure and function of flowers.
11. Explain with examples what is meant by ‘homeostasis’.
12. Write an essay on (any aspect of) the human brain.
13. Outline the operation of a mammalian circulation system.
14. Explain how muscles work.
15. Let us say you want to go to the lavatory. What is happening inside your body? (Choose any scenario.)
16. Describe the physiological systems that will show increased activity in a game of football.
17. Discuss the biology of any medical illness with which you are familiar.
18. Using the standard format of a scientific report (‘Introduction’, ‘Materials and Methods’, ‘Results’, ‘Discussion’, and ‘Tables’ or ‘Figures’), present the hypothesis, design and results of a real or imaginary scientific project.