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*2005 Past GCE
Advanced Level
Biology Paper 2*

June 2005

1. (a) Explain how the electron microscope has contributed to the existing knowledge of the cell.
(b) Describe the fluid mosaic model of the plasma membrane.
(c) How is the structure of the membrane suited for the movement of substances in and out of the cell?
(5, 10, 5 mks)
2. (a) What are the properties of a respiratory surface?
(b) How does oxygen from the atmosphere reach the respiring cells of:
(i) An insect
(ii) A Teleost fish and
(iii) A mammal?
(c) What role does oxygen play in an actively metabolising cell of a mammal?
3. Most organisms carry out either autotrophic or heterotrophic nutrition.
(a) Distinguish between these two forms of nutrition.
(b) A lady ate a piece of fatty pork on Christmas day. Describe the process of digestion and absorption of the pork.
(c) Explain why lipids are suitable storage compounds in living organisms.
4. (a) (i) Give an illustrated account of the life cycle of a named Filicinophyta
(ii) Outline the role of dry and wet conditions in the life cycle above
(b) Why do you consider the Filicinophyta as an intermediary group of plants?
5. (a) Describe what you understand by the following;
(i) Pyramid of biomass (ii) Ecological climax
(b) What part do the following play in an ecosystem?
(i) Saprophytic fungi (ii) Herbivores (iii) Carnivores
(c) Why is it important to conserve ecosystems?

6. (a) Make a large labelled drawing of the Human Immunodeficiency Virus*(HIV) as seen under the electron microscope.

(b) Briefly outline the mode of replication of the virus in humans:

(c) How may HIV/AIDS be:

(i) Spread (ii) prevented?

7. (a) Make a large fully labelled drawing to show the structure of a mammalian heart.

(b) (i) What do you understand by the cardiac cycle

(ii) How is the cardiac cycle brought about?

(c) State how a continuous circulation of blood is maintained in a mammal. (5, 6, 4, 4 mks)

8. Write short notes on the following

(i) All-or-nothing law

(ii) Synaptic transmission

(iii) Counter current multiplier

(iv) Photoperiodism in flowering plants (5x4 mks)