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BIOLOGY

PAPER 1

APRIL 2025



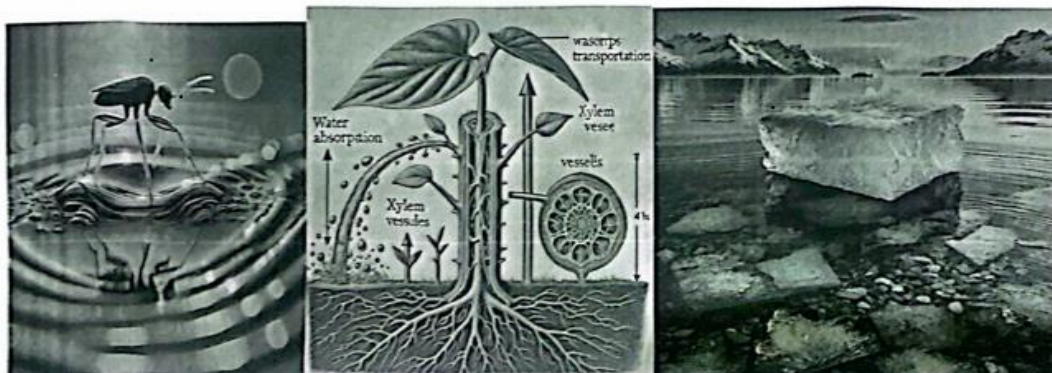
MERRYLAND HIGH SCHOOLS ENTEBBE
UGANDA ADVANCED CERTIFICATE OF EDUCATION
END OF TERM 1 BIOLOGY PAPER
S5
2 HOURS

Instructions

Attempt all questions in this paper.

1. Mr Jelly a biologist observed various phenomenon related to water. He observed that small aquatic striders and fish's semen's can float on surface of water without sinking. He also observed that water can move steadily through narrow plant vessels from roots to the leaves and ice can be formed on the surface of water during cold seasons and aquatic continue thrive below the water surface and he noticed aquatic plant's growth can occur successfully basing on a certain property of water.

Support material



Task

- (a) Which property of water enable insects and fish's semen to float on water. And how does this benefits aquatic system?

- (b) Explain the property of water that explains how it moves through narrow plant vessels and how is this important for plant survival?

- (c) Which property of water explains how ice form on the surface of water and explain how is this important to aquatic life?

d. Explain how aquatic plants like algae brooms are able to make their own food. And explain using a certain property of water.

Item 2

During a biology lesson, the teacher prepared slides of thin slices of a black jack stem, slice of Irish potato and epidermis of onion leaf which students observed using a microscope. Many students said they saw parenchyma tissue while others were confused about the type of tissue they had observed.

Task

(a) Identify the tissues students are likely to have observed.

(b) Describe the structure of a typical parenchyma cell.

(c) Explain the importance of parenchyma tissue observed by the student to the plant.

ITEM 3

Early research on the structure of the cell membrane showed that lipid-soluble compounds passed rapidly into cells. The membrane was found to be selectively permeable to mineral ions, sugars and amino acids. Further work demonstrated that all membranes have the same basic structure but can differ greatly in the types of lipid and protein they contain. Many of the specialized proteins present provide a means of communication between cells and molecules in their environment.

(a) Apart from lipid solubility, suggest two factors which could affect the rate of penetration of a molecule through the membrane.

(b) Describe how the structure of the cell membrane is related to (i) its selective permeability;

(ii) its communication with molecules in the cell's environment.

(c) Describe how prokaryotes and eukaryotes differ in terms of the membrane-bound structures they contain.

(d) If the membrane proteins present in the cell membrane were damaged, suggest what would happen to the cell membrane

END

~Education is the only inheritance that you are guaranteed