S.5 BIOLOGY ASSESSMENT TEST

TIME: 90 MINUTES INSTRUCTIONS: Attempt all questions.

1. (a) How does the structure of the mitochondrion related to its role in energy production. ***(04 marks)***

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(b) In what ways does chloroplast and mitochondrion resemble a bacterial cell? ***(04 marks)***

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(c) Outline the structural and functional differences between smooth Endoplasmic reticulum and Rough Endoplasmic reticulum. ***(02 marks)***

(i) Structural

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(ii). Functional

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2. (a) Give any;

(i) Two similarities between DNA and RNA molecules. ***(02 marks)***

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(ii) Four differences between DNA and RNA ***(04 marks)***

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(b) The diagram shows the sequence of bases on one strand of a short length of DNA **ACC CGA CCC CAG**. This sequence should be read from the left to right.

(i) Give the base sequence that will be produced as a result of transcription of the complete length of DNA shown in the diagram. ***(01 mark)***

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(ii) Give the base of the transfer RNA which will corresponding to the sequence of base shown in the box on the diagram. ***(01 mark)***

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(iii) Identify the enzymes involved in b(i) and (iii) above. ***(02 marks)***

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3. (a)What is meant by alternation of generations ***(03 marks)***

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(b) Ferns and mosses show alternation of generations. State the dominant state in each case

(i) Ferns ……***(01mark)***

(ii) Mosses ……***(01mark)***

(c) Give the importance of alternation of generations in the life cycle of an organism. ***(02 marks)***

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(d) Outline the limitations that mosses face in growing in terrestrial habitats. ***(04marks)***

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4. (a) The evolution of organisms from simple unicellular form into large multicellular forms came up with advantages and some challenges.

(i) Identify any two of these challenges of a multicellular organism. ***(02 marks)***

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(ii) Explain how each of the challenges you have listed in a(i) above have been solved in a large animal. ***(02 marks)***

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(b) An annelid, such as an earthworm is described as a **triploblastic coelomate** with a **bilateral body symmetry**. Explain the meaning of the descriptive terms underlined.

(i) a triploblastic coelomate: ***(02 marks)***

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(ii) a bilateral body symmetry (***01 mark)***

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(c). What is the importance of a coelom to the animal. (04marks)

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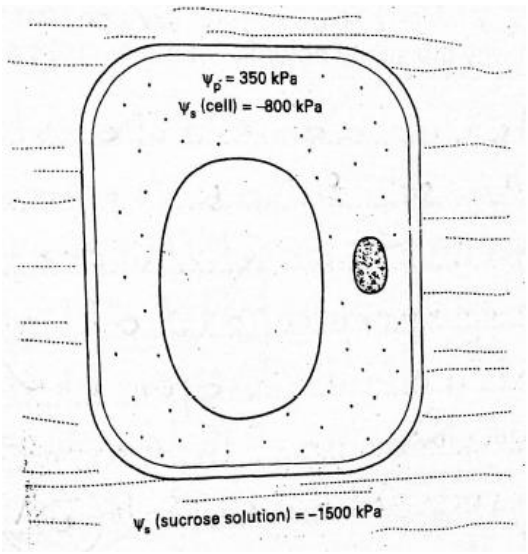
5. The diagram below shows a plant cell, immersed in a sucrose solution. The pressure potential (Ψ_p) of the cell and the solute potential (Ψ_s) of the cell and the sucrose concentration are shown in the diagram.



(a) Define the terms:

(i) Water potential ***(01 mark)***

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(ii) Pressure potential ***(01 mark)***

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(iii) Solute potential ***(01 mark)***

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(b) Calculate the water potential of this cell. (Ψ_{cell}) ***(02 marks)***

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(c) Giving a reason, state whether water will move into or out of the cell. ***(02 marks)***

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(d) Explain why the solute potential of the sucrose solution has a negative value. ***(03 marks)***

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6. (a) State Mendel's Laws of Inheritance ***(02 marks)***

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(b). Inheritance of some traits in the population does not obey Mendelian Laws. What are these conditions? ***(04 marks)***

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(c). Give reasons why Mendel preferred garden peas in his experiment. ***(03 marks)***

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(d) In human beings, brown eyes are usually dominant over blue eyes. Suppose a blue-eyed man marries a brown eyed woman whose father was blue-eyed. What proportion of their children would you predict will have blue eyes? Show your working. ***(04 marks)***

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7. (a) Suggest why the fungi were once classified as belonging to the plant kingdom. ***(02 marks)***

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(b) Explain why in terms of the distinguishing features of fungi this classification was erroneous. ***(04 marks)***

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(c) With examples, state how fungi are useful in nature. ***(04 marks)***

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8. (a) Distinguish between transpiration and guttation? ***(02 marks)***

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(b) Account for the effect of the following factors on the rate of transpiration

(i) Humidity ***(1 ½ marks)***

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(ii) Light Intensity ***(1 ½ marks)***

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(iii) Temperature ***(02 marks)***

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(c). Briefly explain why plants that live at high altitudes exhibit Xeromorphic adaptations. ***(03 marks)***

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END!!!!

"You will experience a painful sharpening from time to time, but this is required if you are to become a better pencil".