

231/1
BIOLOGY PAPER 1
(Theory)
Time: 2 Hours

STRATHMORE HIGH SCHOOL
MOCK EXAM

INSTRUCTIONS

- Write your name, index number and class in the spaces provided.
- Answer ALL the questions in the spaces provided.

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Questions	Maximum Score	Candidate's Score
1 - 40	80	

This examination paper consists of 8 printed pages.

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

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1. (a) Name the organelle one would expect to find in large numbers within a gland. (1 mark)
 2. State two functions of the skeleton found in crabs. (2 marks)
 3. (a) Give the name of the response exhibited by woodlice when subjected to intense unidirectional light. (1 mark)
(b) Suggest the biological values the woodlice derive from the response mentioned in 3(a). (2 marks)
 4. In certain types of insects, eggs develop into adult forms without going through the process of fertilization. What biological term is used to describe this type of asexual reproduction? (1 mark)
 5. Give two environmental conditions that limit the rate of binary fission in bacteria. (2 marks)
 6. Define "apical dominance"? (1 mark)
 7. (a) State the most significant chromosomal behaviour observable during Anaphase I of meiosis. (1 mark)
(b) How is the behaviour mentioned in 7(a) important in achieving the objective of meiosis? (1 mark)
 8. In the physiology of human blood, state the key difference between antigens A and B, on one hand, and the Rhesus antigen on the other. (1 mark)
 9. Name two structural adaptations of a frog's buccal cavity that facilitate the animal's gaseous exchange. (2 marks)

10. How is the cell membrane suited to its role of enabling cell physiology?

(2 marks)

11. Two grammes of active yeast cells were placed in a boiling tube containing 20ml of 10% glucose solution. The boiling tube was then corked tightly and kept in a warm room for a couple of hours. Effervescence was seen in the boiling tube at the end of the experiment.

(a) Write a chemical equation to summarize the reaction in the boiling tube.

(1 mark)

(b) State the role played by the yeast cells in this reaction.

(1 mark)

12. State the basis of comparative embryology in the study of evolution.

(2 marks)

13. Most current debates among environmentalists focus on "climate change" and "global warming".

Indeed, *Oxfam International*, a UK-based humanitarian organization, recently released a report outlining how climate change could be the defining human tragedy of the 21st Century. Explain how large-scale deforestation can ultimately lead to global warming.

(3 marks)

14. The diagram below illustrates an organism a student found growing in a section of the school compound. Use it to answer the ensuing questions.



(a) Name the organism's taxonomic division.

(1 mark)

(b) State the economic importance associated with most members of the sub-division to which the

(1 mark)

15. (a) Aside from peristalsis and churning of food, give another function of the muscles in the mammalian gut. (1 mark)

(b) State the digestive function of polypeptidases. (1 mark)

16. State two functions of the Malpighian layer of the human skin. (2 marks)

17. Figures X and W below are illustrations of the procedures carried out on an aspect of irritability in plants. Figure Z shows the end result of the experiment.

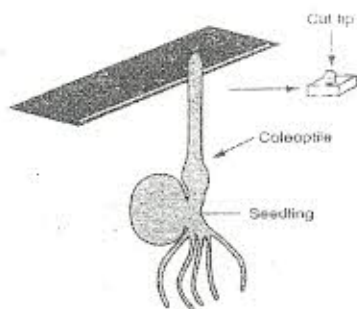


Figure X

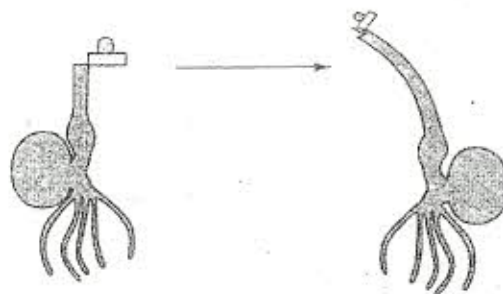


Figure W

Figure Z

Account for the result depicted by Figure Z. (3 marks)

18. (a) What is "genetic counselling"? (1 mark)

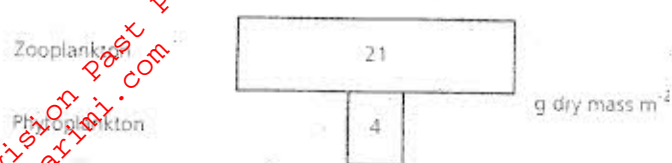
(b) How can basic knowledge of genetics be applied in a criminal justice system to convict crime-suspects? (1 mark)

19. List three distinctive features one would observe in the microscopic examination of the transverse section of the stem of a young bean seedling. (3 marks)

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20. (a) Briefly explain why sweat tends to accumulate on an individual's face during hot humid afternoons? (2 marks)
- (b) Name the part of the human brain that provokes sweating. (1 mark)
21. Why would the carrying capacity of wild herbivores be higher than that for wild sheep in a given terrestrial habitat? (2 marks)
22. What is the significance of photolysis in green plants? (2 marks)
23. Distinguish between wilting and plasmolysis. (2 marks)
24. Ordinarily, cholesterol is useful to the human body. However, excess cholesterol has been associated with a particular vascular disorder.
- (a) State the usefulness of cholesterol in the body (1 mark)
- (b) Name the vascular disorder referred to above. (1 mark)
25. In the preparation of temporary slides of onion cells, a thin epidermal piece is spread atop a clean slide containing a drop of water. A cover-slip is then lowered gently on to the epidermal strip.
- (a) State the use of the water in the above procedure. (1 mark)
- (b) Why is the cover-slip lowered gently on to the epidermis? (1 mark)

26. Suggest why inappropriate pH can affect the active re-absorption of glucose in the renal tubules? (2 marks)
27. Explain the cause of the heterotrophic mode of nutrition exhibited by insectivorous plants. (2 marks)
28. Give two roles of Vitamin D in the human diet? (2 marks)
29. Under similar environmental conditions, plants with variegated leaves usually accumulate less food compared with those whose leaves are non-variegated. Offer an explanation for this. (2 marks)
30. State the role played by the endodermal cells in plant transport. (1 mark)
31. (a) Prostate cancer is a medical condition whose prevalent rate is reportedly rising among males above 35 years old. How does this condition affect the human male reproductive system? (1 mark)
- (b) Name the causative agent of Syphilis, a sexually-transmitted infection. (1 mark)
32. Explain the meaning of "double fertilization" in angiosperms. (2 marks)
33. A pregnant woman suffering from an ovarian disease has her ovaries surgically removed in the sixth month of her gestation period. However, she still manages to carry her pregnancy to full term and delivers a healthy baby. Suggest why the woman does not get complications of the pregnancy despite the loss of her ovaries. (2 marks)

34. The inverted biomass pyramid below was constructed off a section of a marine habitat.



- Suggest an explanation for the inverted nature of the biomass pyramid. (2 marks)
35. (a) State the biological term used to describe immunity conferred by the transfer of antibodies from an animal to a human being. (1 mark)
- (b) Give an example of a human disease prevented by the immunity stated in 35 (a). (1 mark)
36. (a) Name the chemical substance that facilitates synaptic transmission. (1 mark)
- (b) State the effect of a named hormone secreted by the adrenal cortex. (2 marks)
37. An accident-victim lost the ability to walk due to severe injury to the spinal cord.
- (a) Suggest the cause of the person's loss of locomotive ability. (1 mark)
- (b) What is the structural difference between the spinal cord's grey matter and white matter? (2 marks)
38. The *Red fox* has 34 chromosomes while the *Arctic fox* has 52. Occasionally, the *Red fox* mates with the *Arctic fox* resulting in a hybrid known as the *Rare fox*. What would be the diploid constitution of the *Rare fox*? (1 mark)

39. Name the end products of glycolysis.

(2 marks)

40. The spread of the melanistic form of the peppered moth (*Biston betularia*) through the industrial cities of Britain midway through the 20th Century can be likened to the current spread of insecticide-resistant pests across most Kenyan farmlands.
Both phenomena involve

(1 mark)