Name……Class…… Adm No……
231/1
Biology **SIGN……**
Theory
FORM FOUR **DATE…….**
2 hours

BARINGO COUNTY EDUCATIONAL IMPROVEMENT EXAMINATIONS 2011

(Kenya Certificate of Secondary Education)

BIOLOGY THEORY

Instructions

- Write your name, class and admission number in the space provided above.
- Write the date of the examination and sign in the space provided above.
- Answer ***all*** the questions in the spaces provided.
- You **WILL** be ***penalized*** for wrong spelling especially technical terms.

For Examiner's Use Only

Question	Maximum Score	Candidate's Score
1-28	80	

This paper consists of 15 printed pages.
Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.

1. An experimenter placed a hungry rabbit and a stone in containers K and L respectively. She then placed a cabbage leaf into each of K and L and left the set up for ten minutes. Identify the expected results. (1mk)

---

2. (a) Explain the production of an infertile offspring in a mating between the jackal, *Canis aureus* and the dog, *Canis familiaris* (1mk)

(b) Name the kingdom whose members are described as prokaryotic (1mk)

---

3. Give two reasons why potato tubers become sweeter after boiling. (2mks)

---

4. . Explain the absence of elaborate excretory systems in plants. (1mk)

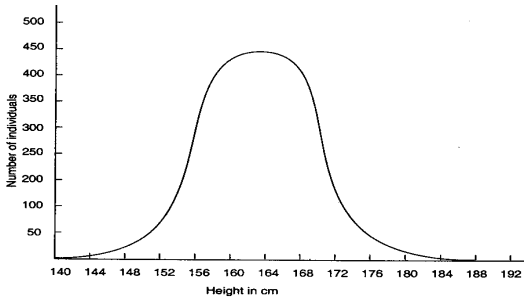
---

5. Give two adaptive features that make a predator efficient in capturing prey.

(2mks)

---

6. In an experiment to observe some variations in lengths of leaves of Jacaranda, the following curve was obtained;



(i) Identify the type of variation illustrated by the curve.

(1mk)

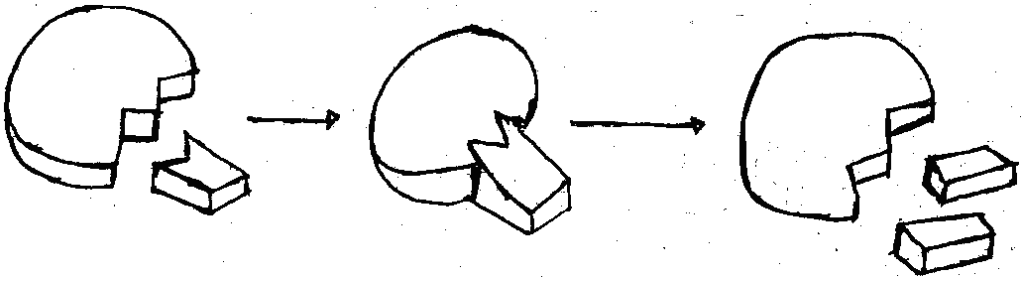
---

ii) Explain the cause of the variation you have named in (i) above. (1mk)

---

7. Study the diagrams below and then answer the questions that follow.

Enzyme + Substrate ⟶ Enzyme-substrate complex ⟶ Enzyme + Products



(a) Identify one property of enzymes illustrated by the diagrams. (1mk)

(b) Name any one protein digesting enzyme in human beings. (1mk)

---

8. (a) What is a drug? (1mk)

_____

_____

(b) How does drug abuse expose one to the dangers of HIV/AIDS infections? (1mk)

---

9. (a) What is active transport? (1mk)

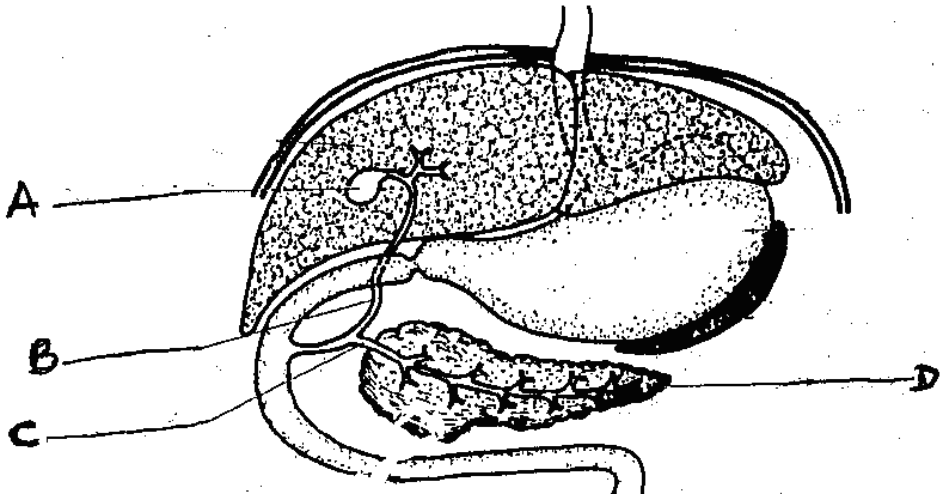
(b) Propose the mechanism by which the process in (a) above occurs. (1mk)

(c) Name any one factor that affects the mechanism mentioned in (b) above.

(1mk)

---

10. Study the diagram below and then answer the questions that follow.



(a) Identify the structures marked A, B, C and D (2mks)

A----------

B ----------

C----------

D----------

(b) Name the specialised cells in structure D that secret hormones. (1mk)

---

11. (a) State the phylum and class of the organism shown below.

(i) Phylum ……. (1mark)

(ii) Class …… (1mark)

b) State one characteristic used to place the members of the phylum you have named in (a) above into classes. (1mark)

……

……

12. (a) From the formation point of view, distinguish fraternal from identical twins. (2mks)

(b) Comment on the sexes of identical twins (1mk)

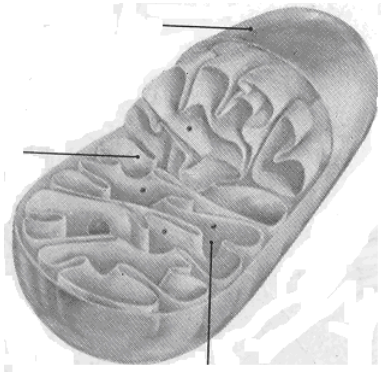
---

13. (a) Explain why blood does not clot inside the blood vessels of human beings. (1mk)

(b) Other than transport, state any two functions of blood. (2mks)

---

14. Study the illustration of a cell organelle shown below



(a) Using any of the label lines on the illustration name the part in which the second phase of respiration occurs. (1mk)

(b) Name a respiratory substrate usually available for energy release during starvation. (1mk)

(c)What is respiratory quotient? (1mk)

---

15. State the functions of the following organelles.

(a) (i) Contractile vacuole (1mk)

(ii) Plasma membrane (1mk)

(b) Give one example of a cell in which you would expect to have numerous golgi bodies. (1mk)

---

16. Outline two functions of the skeleton in human beings. (2mks)

---

17. (a) Explain how comparative embryology can be used as evidence for organic evolution. (1mk)

(b) What was wrong with Lamarck's theory of evolution? (1mk)

(c) What is adaptive radiation? (1mk)

---

18. (a) Give two differences between pyramid of biomass and pyramid of numbers. (2mks)

(b) Why is pyramid of biomass a better method of representing ecological relationships in habitats? (1mk)

---

19. Name the types of joints formed by each of the following pairs of bones;-

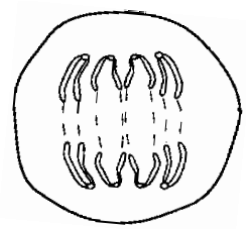
(i) Axis and Atlas (1mk)

(ii) Humerus with clavicle and scapula (1mk)

(iii) Tibia and fibula with femur (1mk)

---

20. Study the illustration below then answer the questions that follow.



a) Identify the type of cell division shown in the diagram

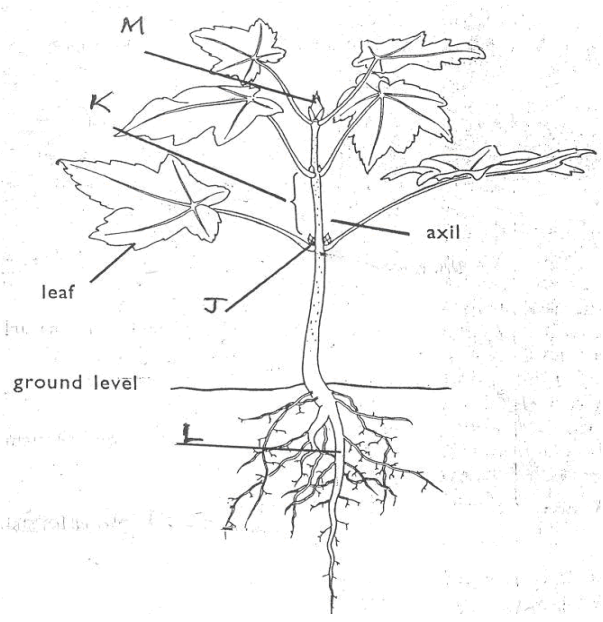
(1mark)

(b) Give a reason for your answer in (a) above (1mk)

(c) What is the significance of crossing over between non-sister chromatids during prophase? (1mark)

---

21. Study the diagram below and then answer the questions that follow.



(a) Identify the structure shown (1mk)

(b) Label the parts represented by J, K, L, and M. (2mks)

J----------

K----------

L----------

M----------

(c) Bracket the part of the diagram that positively responds when illuminated unilaterally. (1mk)

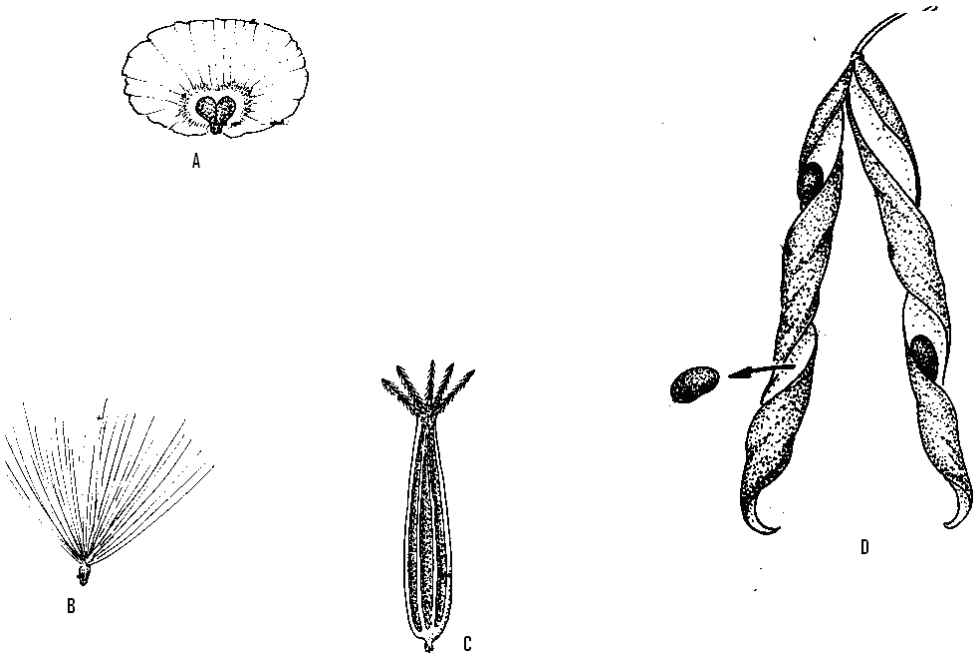
22. (a) State two structural differences between sclerenchyma and collenchyma (2mks)

(b) Name the most abundant support tissue in herbaceous plants. (1mk)

(c) Name a tissue in plants which has lignin as the main support material. (1mk)

---

23. Study the diagrams A, B, C and D shown below.



(a) Identify the type of dispersal represented by :-

B ---------- (1mk)

C ---------- (1mk)

D ---------- (1mk)

(b) On A label the part that facilitates dispersal. (1mk)

24. (a) How do the following factors affect the rate of breathing in human beings?

(i) Emotions (1mk)

(ii) Altitude (1mk)

(b) What is the significance of the counter-current flow system in the gills of Tilapia fish? (2mks)

---

25. (a) A man involved in an accident had his brain damaged. His breathing rate became slow and he lost body balance. Which parts of the brain were damaged so as to: -

(i) have low rate of breathing (1mk)

(ii) Loss of body balance (1mk)

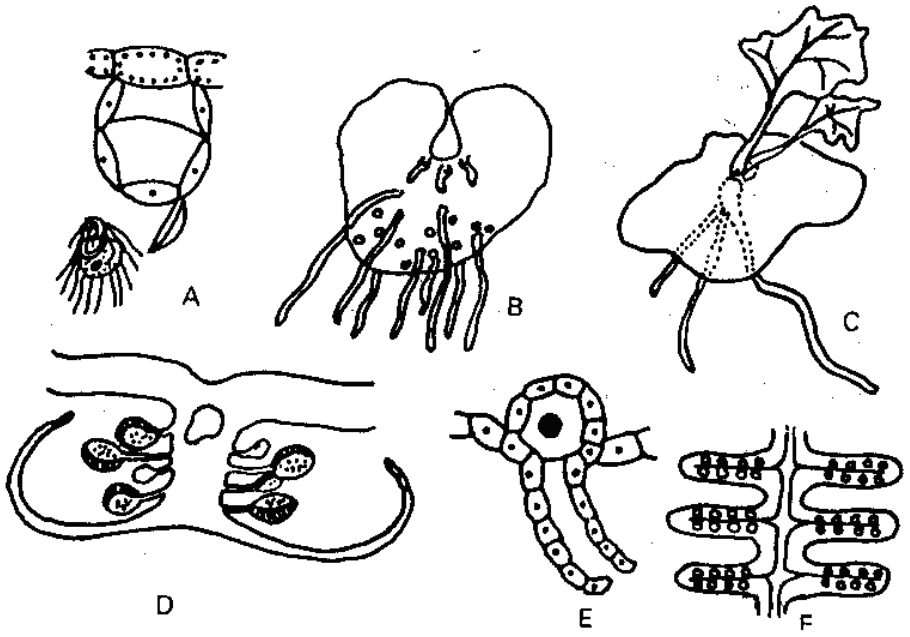
(b) Name the structures associated with the following in human beings:-

(i) Region of highest visual acuity (1mk)

(ii) Amplification of vibrations. (1mk)

---

26. The diagrams A to F below show the stages in the life cycle of a certain Pteridophyte.



(a) Identify the Pteridophyte (1mk)

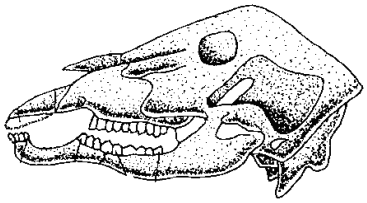
(b) Give a general name for stages A and E. (1mk)

(c) Give the correct sequence of events that occur in the life cycle. (1mk)

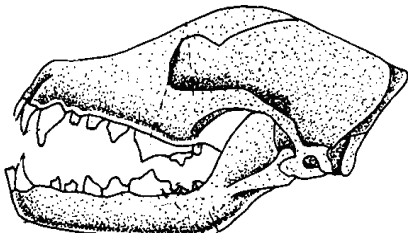
(d) Give one reason for seed dispersal in Angiosperms. (1mk)

---

27. The diagrams below show skulls of animals from two different groups.



A



B

(a) Giving a reason state the diet of A and B (2mks)

(i) Diet of A ($^1/_2$mk)

Reason ($^1/_2$ mk)

(ii) Diet of B ($^1/_2$mk)

Reason:- ($^1/_2$mk)

(b) Establish the dental formula for A (1mk)

(c) Using letter D, bracket the part on A that lacks teeth. (1mk)

28. (a) How does each of the following structures in the mammalian skin assist in homeostasis?

(i) Cornified layer (1mk)

(ii) Sebaceous glands. (1mk)

(b) Explain why protein is absent in urine (2mks)

THIS IS THE LAST PRINTED PAGE