

Name..... Adm No.....
School..... Class.....
Signature..... Date.....

BIOLOGY

PAPER 1

FORM FOUR

TIME:2 HOURS

KCSE TOP PREDICTION MASTER CYCLE 8

INSTRUCTIONS

1. All Questions are Compulsory
2. Write your Answers in the Spaces Provided
3. Wrong Spelling of Technical Terms shall be Penalized

Max Score	Student's Score
80	

1. State **TWO** ways in which the study of Biology has helped the world in the accelerated fight against the recent Covid-19 pandemic. *(2mks)*

.....
.....
.....

2. a) Give **ONE** function of centrioles *(1mk)*

.....
.....

b) Name a Kingdom in which all members lack centrioles in their cells *(1mk)*

.....

3. a) Name the skin pigment formed by cells in the mammalian skin

.....*(1mk)*

b) Which genetic disorder is associated with the absence of the pigment named in 2a)?

.....*(1mk)*

c) How does the skin pigment help protect human beings against skin cancer?

.....*(1mk)*

4. Explain the following observations

a) More water hyacinth plants are found growing along the shore of Lake Victoria than in the deep waters

.....
.....*(1mk)*

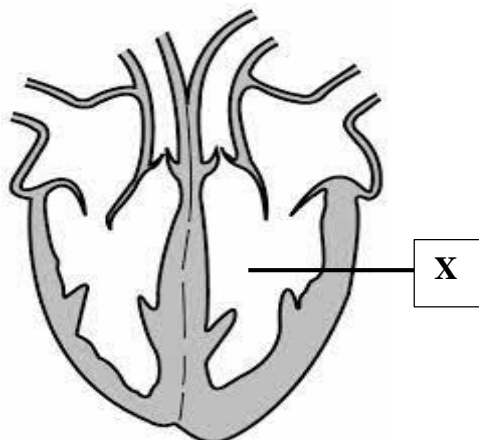
b) Green plants grow faster in lower altitudes areas than in higher altitude areas

.....
.....*(2mks)*

5. State **TWO** functions of a cover slip in light microscope work

.....
.....(2mks)

6. Use the diagram of the heart shown below to answer the questions that follow



- a) From the diagram, give a reason to show that X is the left ventricle
.....(1mk)
- b) Name a class of organisms where all members have the heart structure above
.....(1mk)
- c) Why are the muscles found in the heart above said to be myogenic?
.....(1mk)

7. Account for the following

- a) Red blood cells lack mitochondria
.....(1mk)
- b) The testes are found hanging outside the body in male human beings
.....(1mk)

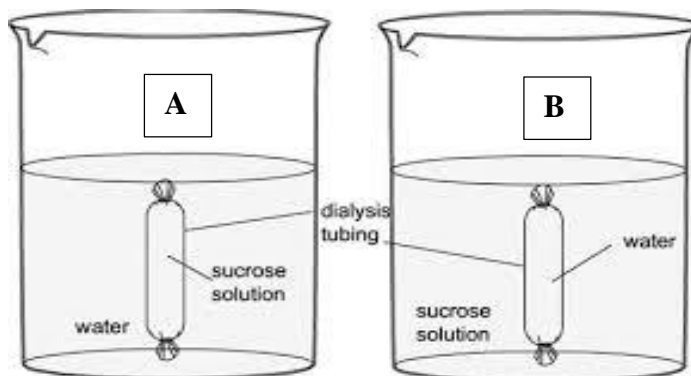
8. a) Why is pancreas said to be a dual gland?

.....
.....(1mk)

b) Name the endocrine tissue in the pancreas

.....
(1mk)

9. A student made a set up shown below to study a physiological process

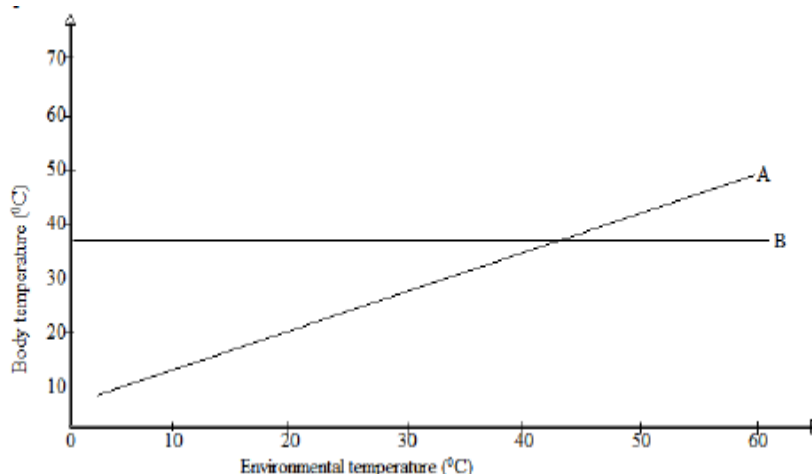


a) In which beaker did the dialysis tubing reduce in size?
(1mk)

b) Account for your answer in a) above

(2mks)

10. The diagram below shows a graph of body temperature of two different organisms against changing environmental temperature

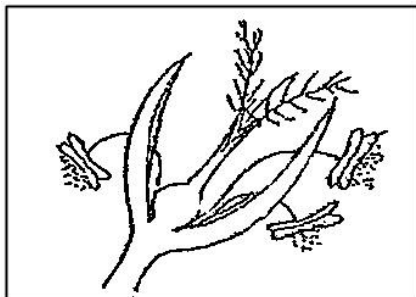


a) State the name used to refer to animal **A** in terms of thermoregulation
(1mk)

b) State **TWO** advantages animal **B** has over animal **A**

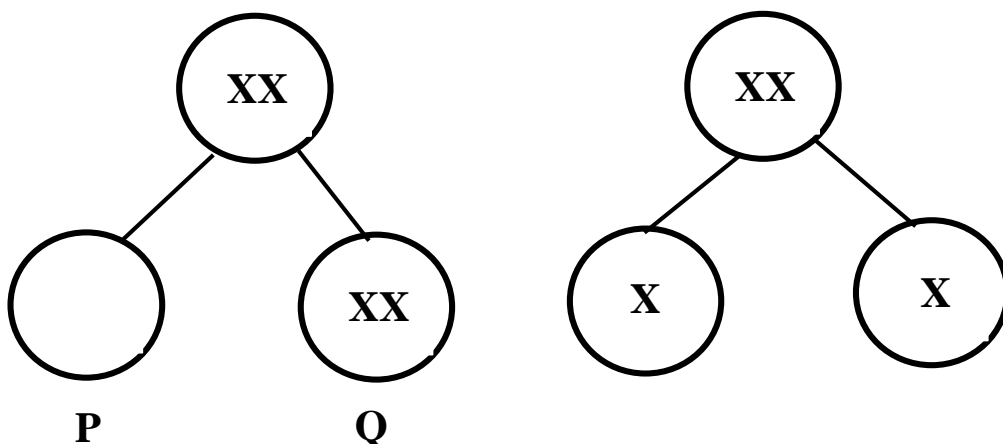
.....
.....
.....(2mks)

11. The diagram shown below is of a flower



- a) Name the agent of pollination for this flower
.....(1mk)
- b) Give **TWO** adaptive features from the diagram to support your answer in a) above
.....
.....(2mks)

12. The process of gamete formation is represented below



- a) State a reason why the process above represents gamete formation in female mammals
.....
.....(1mk)
- b) Name the chromosomal mutation represented above

.....(1mk)
c) Identify the genetic disorder that arise when the following gametes are fertilized

i) P(1mk

ii) Q(1mk

13. A sample of air was passed through pyrogallic acid and its volume reduced from 8 cm³ to 7 cm³. When it was later passed through lime water, the volume reduced to 6.8cm³.

a) What was the role of pyrogallic acid in this experiment?

.....(1mk

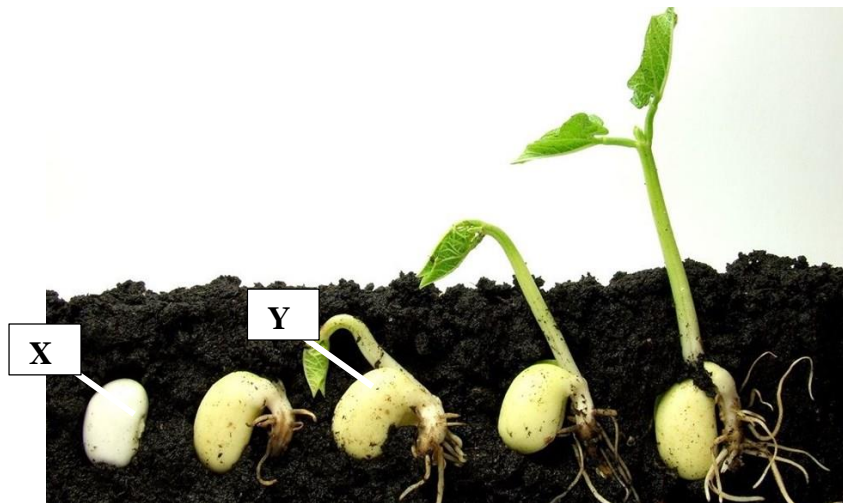
b) Determine the percentage of Carbon (IV) oxide in the sample of air

.....
.....
.....(2mks

c) Is this sample of air exhaled air or inhaled air?

.....(1mk

14. The stage-wise process of germination of a seed is shown below



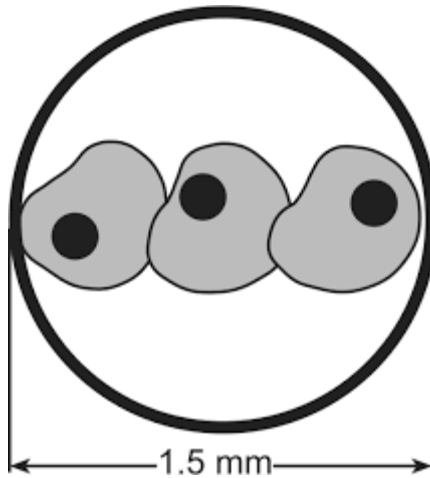
a) Give a reason why the diagram above represents hypogeal germination

.....(1mk

b) Account for the change in dry weight of the cotyledon at stage X and Y

.....
.....
.....
.....(2mks

15. Barbra observed animal cells in a field of view of a light microscope as shown below. If she used a total magnification of X1000 determine the actual diameter of one cell



.....
.....
.....
.....
.....(3mks

16. Explain the importance of the following features

a) Acrosome in the spermatozoa

.....
.....(2mks

b) Hair-like structures in the fallopian tube

.....
.....(1mk

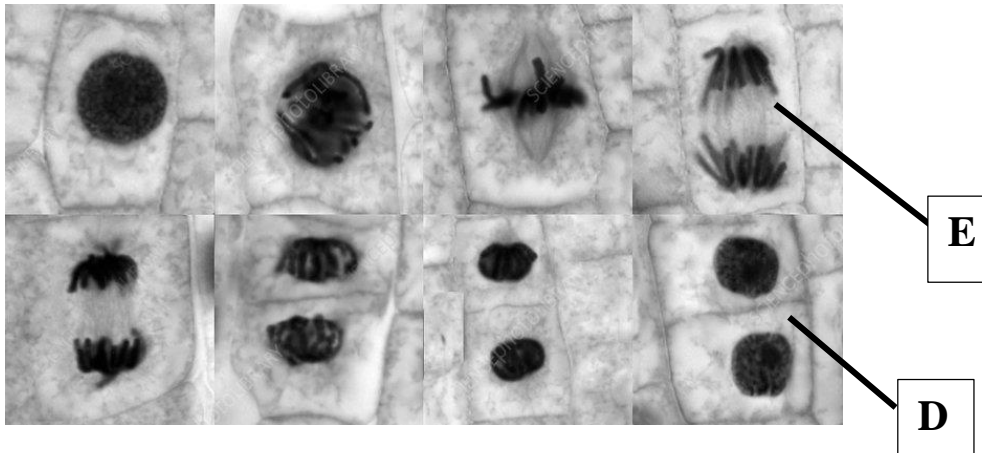
17. a) What are vestigial structures?

.....
.....(1mk)

b) Explain why divergent evolution is advantageous to living organisms?

.....
.....(2mks)

18. The various stages of mitosis are represented below



a) Identify the stages represented by the letters:

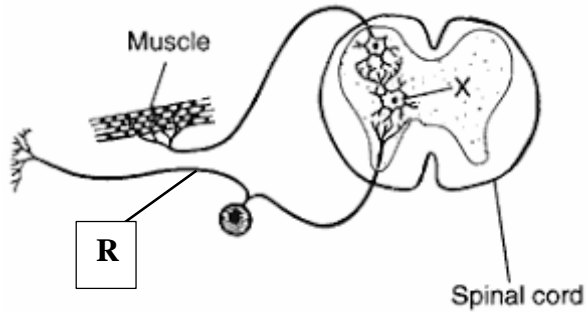
i) **D**(1mk)

ii) **E**(1mk)

b) What shows that the process represented above is taking place in a plant cell?

.....
.....(1mk)

19. The diagram shown below represents the various nerve cells



a) Use arrows to show direction of impulse in a reflex arc in the diagram above (1mk)

b) Outline expected **TWO** structural differences between nerve cell **R** and **X**

.....

(2mks)

20. State the function of the following muscles in the body

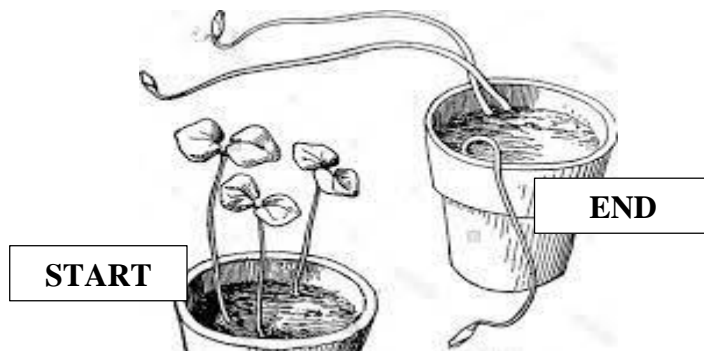
i) Cardiac sphincter muscles

.....
(1mk)

ii) Erector pili muscles

.....
(1mk)

21. The diagrams below are of seedlings before and after an experiment.



a) Under which light condition was the experiment carried out

.....(1mk)

b) Which term describes the appearance of the seedlings at the end of the experiment

.....(1mk)

c) What is the importance of the above experiment in crop production?

.....(1mk)

22. State the function of the following cells in the body of organisms

a) Palisade

.....(1mk)

b) Schwann

.....(1mk)

c) Sertoli

.....(1mk)

23. a) Mary suspects that she has diabetes mellitus. Using a sample of her urine describe a school laboratory procedure she can follow to confirm it is true

.....

.....

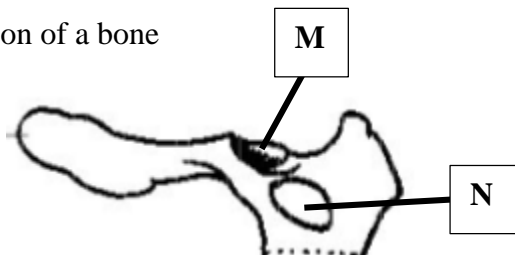
.....(3mks)

b) Why is insulin not administered orally?

.....

.....(1mk)

24. The following is an illustration of a bone



a) Give the name of the bone

.....(1mk)

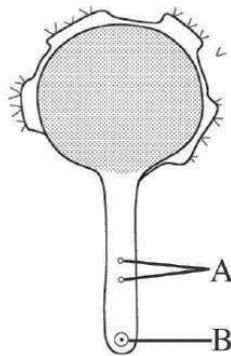
b) State an advantage of the joint formed at the part labelled M
.....(1mk

c) State the function of the part labelled N
.....(1mk

25. a) Distinguish between population and community as used in ecological studies
.....
.....
.....(2mks

b) State the formula for population estimation using capture recapture method
.....
.....
.....(1mk

26. The diagram below shows the structure of germinating pollen grain



a) Name the type of cell division that formed the parts labelled A
.....(1mk

b) State the role of part labelled B
.....
.....(1mk

27. The picture of a common animal is represented below



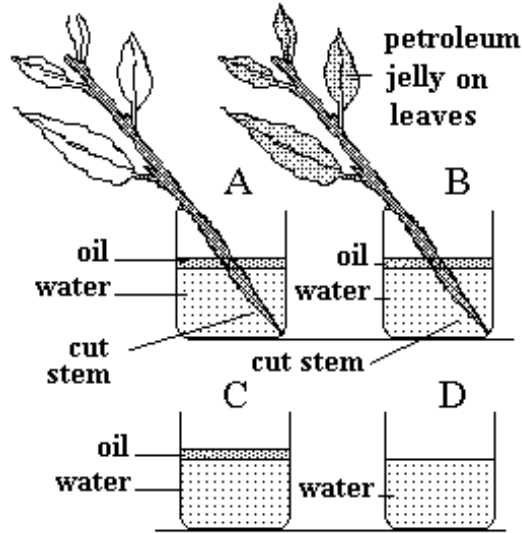
a) Name the class to which the organism shown above belongs

.....(1mk)

b) Give **TWO** reasons for your answer in a) above

.....
.....
.....(2mks)

28. The following experimental set up was placed in sunshine to investigate a biological process



a) Account for the expected result in the level of water in the beaker labelled **B**

.....

(2mks)

b) Why were the set up **C** and **D** included in the experiment?

.....(1mk)