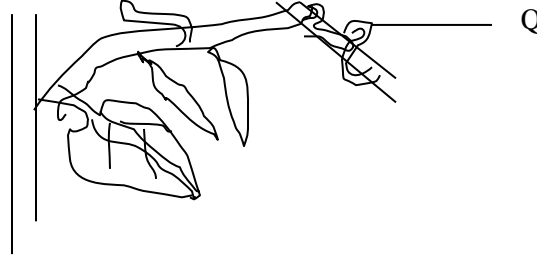


Name.....Index No.....

BIOLOGY
FORM 4 TERM 3 2025
OPENER EXAMINATION
TIME: 1 ¼ HOURS

1. Study the diagram below and answer the questions that follow.



- a) Identify the part labelled Q. (1 mark)

Tendrils

- b) (i) What type of response is shown above? (1 mark)

thigmotropism

- (ii) What is the importance of the above response?

(1 mark)

Support

- c) Explain how the response exhibited by part Q occurs. (4 marks)

When auxin comes into contact with the object they literally migrate to the opposite side causing more cell division and the tendril coils around object.

- d) Name the plant hormone that is responsible for this response. (1 mark)

auxin

2. The genetic disorder haemophilia is due to a recessive sex linked gene. A man who is haemophiliac married a woman who is a carrier for the condition.

- a) Using the letter (H) to represent the normal condition and (h) for the haemophiliac condition.

- (i) What is the genotype of the man and woman? (2 marks)

Man X

Woman.....

- (ii) Work out a cross between the man and woman. (3 marks)

.....

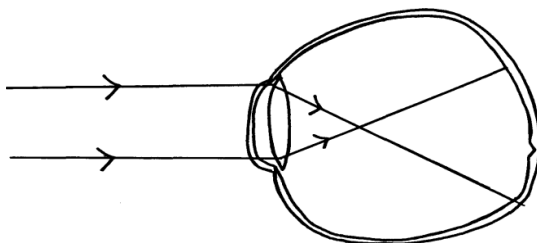
b) What is the chance that both the first and second sons will be haemophiliac? (2 marks)

$$\frac{1}{4}$$

c) Haemophilia is more common in males than in female humans. Explain. (1 mark)

Absence of the corresponding X chromosome

3. The diagram below shows the position of an image in a defective eye.



(a) (i) Name the defect

(1 mark)

1. I Short sightedness/Myopia

(ii) State two causes of the defect

(2 marks)

ii) Long eye ball; too much refractive power of the eye lens

(b) Explain how the defect in a(i) above can be corrected.

(1 mark)

b)Wearing a concave /diverging lenses

(c) Tabulate three differences between cones and rods .

(3 marks)

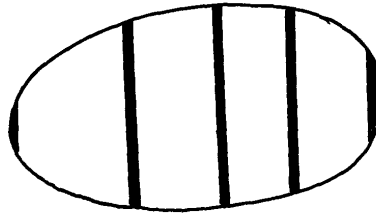
Rods	Cones
Perceive light of low intensity/dim light	Perceive light of high intensity/bright light
Have retinal convergence	Lack retinal convergence
Contain photochemical-Rhodopsin	Contain photochemical-Iodopsin
Do not perceive colour	Perceive colour

(d) State the importance of tears secretion in an animal.

(1 mark)

Tears wash away irritating materials in the eyes and keep the eye moist

4. In a class experiment to establish the size of an onion cell, a learner observed the following on the microscope field of view.



If the student counted 20 cells across the diameter of this field of view, calculate the size of one cell in micrometers. (3 marks)

Size of the cell = $\frac{\text{field of view}}{\text{Number of cells}}$

Number of cells

$$4000/20=200\mu m$$

- b) Identify the structures of the cells that perform the following functions:- (3 marks)

(i) synthesize ribosomes.

nucleous

(ii) regulate exchange of substances in and out of the nucleus.

Nucleus membrane pores

(iii) osmoregulation in amoeba

Contractile vacuole

- c) Why are the following procedures done when preparing sections to be observed under a light microscope? (2 marks)

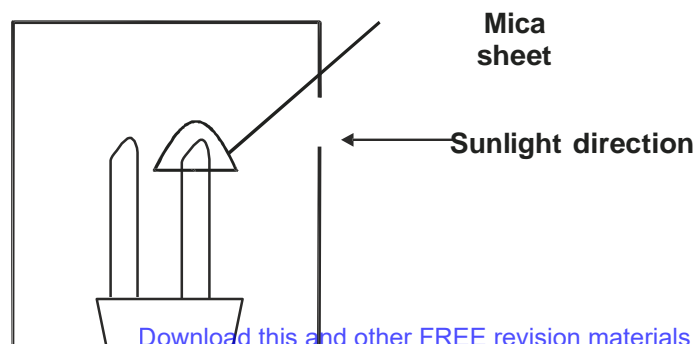
(i) Making of thin sections.

illumination

(ii) Using a sharp blade to make the sections

To avoid damaging of cells

5. The diagram below represents growing seedling which were subjected to unilateral light at the beginning of an experiment.



a) i) State the result of P and R.

(2 marks)

P - Will bend towards light;

R Continue growing

upright;.....
.....

ii) Account for your answer in (a) (i) above.

(2 marks)

R - Mica sheet reflect light hence uniform distribution of IAA in the seedling

P- Light causes lateral migration of auxins to dark side of the seedling causing faster growth on darkside than lightside hence curvature;

b) (i) If the apical bud of seedling P was removed, what results would be expected after 5 days.
(1 mark)

Sprouting of lateral buds into branches

ii) Explain your observation in (b) (i) above.

(2 marks)

Apical shoot is source of IAA; Low IAA concentration stimulate lateral bud to sprout out;

c) What is the significance of the practice in b (i) above in agriculture?

(1 mark)

Increased yields

6. What is meant by :

2mk

a) Organic evolution?

Life changes from simple form to more complex form

b) Continental drift?

The distribution of organisms due to splitting of the land mass

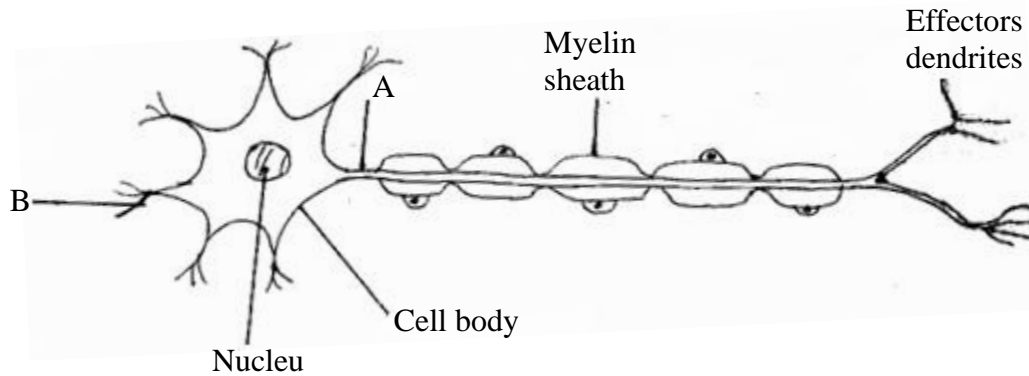
7. State the importance of divergent evolution to organisms.

2mk

Ease competition

Enhance modification that makes organisms to be more better than before

8. Study the diagram **below** of a neurone in human being.



(a) Identify the neurone. Motor neurone (1mk)

b) Name the parts labelled.

A Axon (1mk)

B Dendrite (1mk)

9. State three biological importance of tropic responses in plants. 3mk

- a) *Enhance fertilization in flowering plants*
- b) *Enable the plant to acquire light for photosynthesis*
- c) *Enhance support*
- d) *Enable roots to grow deeper in search of water*