

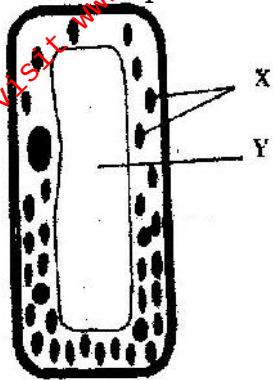
BIOLOGY 231/1 K.C.S.E 2005

QUESTIONS

SECTION A (20 MARKS)

Answer all the questions in this section in the spaces provided.

1. Apart from hearing, state another function of the human ear. (1mk)
2. The diagram below represents a cell.

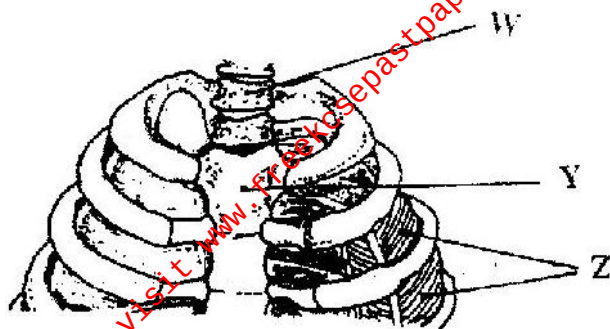


- (a) Name the parts labeled X and Y (2mk)
X
Y
- (b) Suggest why the structures labelled X would be more on one side than the other. (1mks)
3. What is the role of the vascular bundles in plant nutrition? (3mks)
4. What is meant by
 - a) Organic evolution (1mks)
 - b) Continental drift? (1mks)
5. To which class does an animal with two body parts and four Pairs of legs belong? (1mk)
6. Name the substance which accumulates in muscles when respiration occurs with insufficient oxygen. (1mks)
7. State the importance of osmosis in plants. (3mks)
8. Name three factors in seeds that cause dormancy. (3mks)
9. Why would carboxyhaemoglobin lead to death? (2mks)
10. Name the organism that causes amoebic dysentery. (1mks)
 - a) Name the process through which energy from the sun is incorporated into the food web. (1mk)
 - b) State the mode of feeding of the birds in the food web (1mk)
 - c) Name two ecosystems in which the organisms in the food web live (1mk)
 - d) From the information in the food web, construct a food chain with the large bird as a quarternary consumer. (1mk)
 - e) What would happen to the organisms in the food web if bird N migrated? (3mks)
 - f) Not all the energy from one trophic level is available to the next level. Explain (3mks)
 - g)
 - (i) Two organisms which play a role in the ecosystems are not included in the food web. Name them. (2mks)
 - (ii) State the role played by the organisms named in g(i) above. (1mk)

SECTION B (40 MARKS)

Answer all the questions in this section in the spaces provided.

11. The diagram below represents a part of the rib cage.



- a) Name the parts labeled W, Y and Z. (3mks)

W
Y
Z

- b) How does the part labeled Z facilitates breathing in? (3mks)

12. In a garden with plants of same species, 705 plants had red flowers while 224 had white flowers.

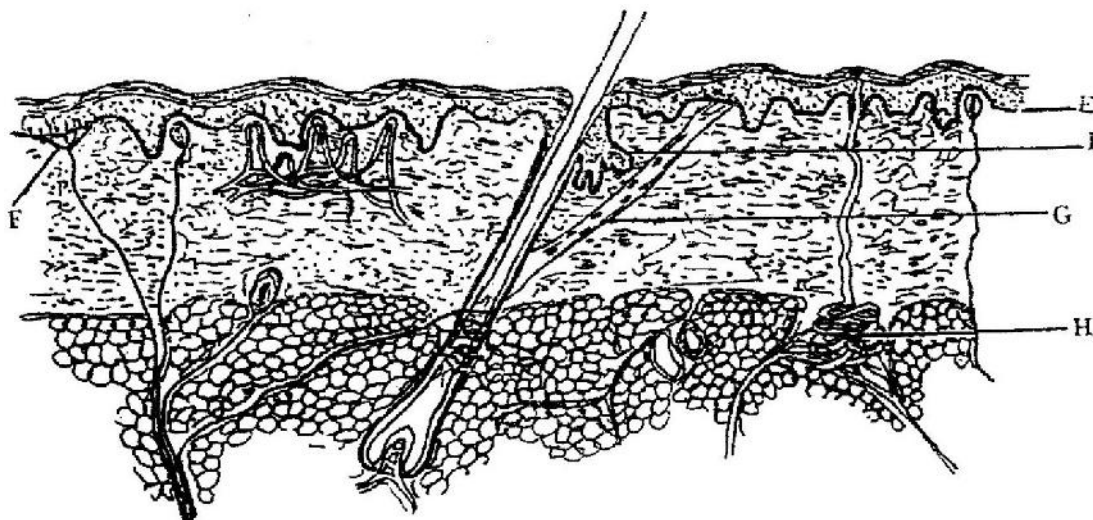
- a) Work out the ratio of red to white flowered plants (1mk)

- b) (i) Using letter R to represent the dominant gene, work out a cross between F1 offspring and a white flowered plant. (4mks)

(ii) What is the genotypic ratio from the cross in b(i) above? (1mk)

- c) What is meant by the term allele? (1mk)

13. The diagram below shows a section through the mammalian skin.



- a) Name the parts labeled E, F and G. (3mks)

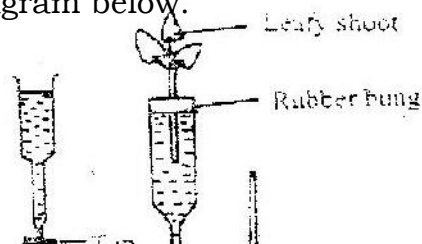
E
F
G

- b) State two functions in each case of substance secreted by the structures labeled.

(i) H (2mks)

(ii) I (2mks)

14. A set up that was used to investigate certain process in plants is shown in the diagram below.

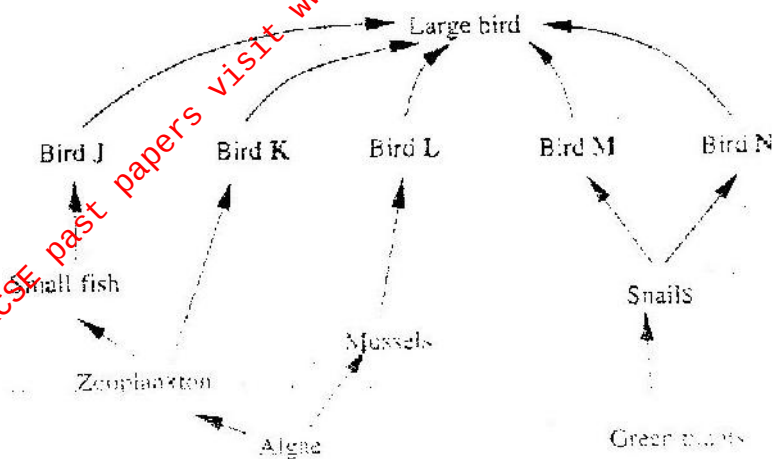


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15. a) What process was being investigated? (1mk)
b) (i) State two precautions that should be taken when setting up the experiment. (2mks)
(ii) Give a reason for each precaution stated in b(i) above. (2mks)
c) State three environmental factors that influence the process Under investigation. (3mks)
16. a) What is meant by the terms
(i) Epigynous flower (1mk)
(ii) Staminate flower? (1mk)
b) How are the male parts of wild pollinated flowers adapted to their function? (4mks)
16. a) Name two organisms that cause food spoilage (2mks)
b) Name two modern methods of food preservation and for each state the biologic principle behind it. (4mks)

SECTION C (40 MARKS)

Answer question 17 (compulsory) and either question 18 or 19 in the spaces provided after question 19.

17. After an ecological study of feeding relationships students constructed the food web below.



- a) i) State three human activities that would affect the ecosystems. (3mks)
- ii) Explain how the activities stated in h(i) above would affect the ecosystems. (3mks)
18. Describe how gaseous exchange takes place in terrestrial Plants. (20mks)
19. How is the human eye adapted to its function? (20mks)

MARKING SCHEME BIOLOGY PAPER 2 (PRACTICAL) KCSE 2005

Each candidate will require the following

A shoot of maize plant with some leaves labeled specimen X
 A leafy shoot of *Bidens pilosa* labeled specimen Y
 Iodine solution
 Benedict's solution
 Means of heating / water bath
 Means of cutting / scalpel
 6 test tubes
 Test tube rack
 Test tube holder
 Water in 50ml beaker
 Dropper
 Means of labeling
 Pestle and mortar
 A hand lens
 Dissecting needle / pins
 A leafy twig of hibiscus plant with regular flowers labelled specimen S1
 A leafy twig of bougainvillea with some mature flowers labeled specimen S2
 An onion bulb with growing roots and growing aerial leaves labelled specimen p.
 A shoot of tradescantia with flowers labeled specimen Q

Note: onion bulbs can be made to develop roots and leaves by planting them in saw dust / sand.

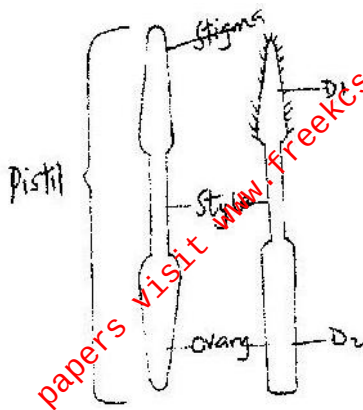
Fleshly picked growing onions with roots intact can be used.

1.

Specimen	Steps followed	Identity
S1	1a,2a,3b,4b,6b	Malvaceae
S2	1a,2a,3b,4a,5b,8a	Nyctaginaceae
Q	1a,2b,	Commelinaceae
X	1a,2a,3a	Graminae
Y	1b,	Asteraceae

- b) i) S₁- Dicotyledonous
 Q- Monocotyledonae
- ii) S₁ – Floral parts in threes (3, so multiples of 3/6 stamens / 6 anthers / 3 petals.
- c) -Presence of large brightly coloured bracts / petals / perianth, to attract insects.
 (Reject it is brightly coloured)
 -Anthers and stigma enclosed in a tube, to be reached by insects
 - Scented to attract insects.

d)



D1 – Continuous outline

- No shading

D2 – Proportionality and accuracy

- Long stigma (feathering) stigma thinner than stigma and ovary

- Oblong ovary

Magnification = $\frac{\text{Length of drawing / image (units)}}{\text{Length of actual specimen (units)}}$

= x (2-10)

* No units = Ref. answer

Wrong computation = Ref. answer

2. (a) T1 – Molar tooth

Reasons

i) Presence of cusps / ridges

ii) Presence of three roots

T2 – Incisors

Reasons

i) Chisel shaped / wide (sharp) edge / wedge shaped

Ref. one root

b) Cusps /ridges any upper white part

Crown – Black part below cusps

Neck - Boundary between white and black parts

Root – white lower part divided into 3

Enamel – All over the part seen

Dentine – Upper part below the cusps

c) J – vegetation, grass, shrubs, herbs, plants / leaves

Ref. vegetative , pasture, greens, grass eaters, herbivore, herbivorous but mark reason.

Reasons

-Presence of diastema

- Absence of teeth (incisors and canines) at the front part of the upper jaw

-Presence of horny pad

-Presence of (premolars)cusps(for grinding vegetation)

K- Flesh/meat

Rej; carnivores/carnivorous, flesh eater but mark reason

Reasons

Presence of (pronounced) long curved sharp pointed canines for gripping / tearing, holding/grasping prey
 Ref; large
 -Presence of carnassial teeth, for cutting and crushing bone



Inset – last on both sided
 Photo – 2nd to the inside

- e) $J - 2 (10/3Co/1pm3/3m 3/3) = 32$
 $K - 2 (13/3C1/1pm4/4m 2/3) = 42$
 *teeth types must be identified using letters
 Rej; If missing
 *Demarcating lines must be present
- f) J
- g) Refer to diagram area below main white part.

3. P(onion bulb with leaves and roots)
- a) i) Inner succulent/ juicy / flesh while outer is dry
 - Inner is thicker while outer is thin / membranous / scaly
 NB: Comparison must be seen otherwise deny a marks
- ii) Inner swollen with food for storage and outer for protection against dessication / mechanical injury / excessive loss of water / microorganisms / invasion by fungi.
- Rej: Storage of water alone, & prevent water loss.

5.

Extract	Procedure	Observations	Conclusion
Roots	Add iodine	No colour changed colour of iodine Brown yellow retained / persist	Starch absent
	Add benedicts solution and boil/ Heat/warm/place in a hot water bath	Blue to green to orange/ brown (acc. brick red, ref. red)	Reducing sugars present/simple sugars.
Bulbs	Add iodine	No colour change colour of iodine	Starch absent
	Add benedict solution and boil	Green to yellow to orange / brown	Reducing sugars present
Aerial leaves	Add iodine	No colour change	Starch absent
	Add benedicts solution and boil	Green to yellow to orange to brown	Reducing sugars present

* Green end – conclusions must be traces of reducing sugars

* Wrong procedures, deny observation and conclusion marks

c) Roots

- Presence of reducing sugars translocated from the bulb/aerial Leaves, for provision of energy/respiration for growth and development/respiration for growth and development/metabolic activities.
- Absence of starch because roots are not a storage organ.

ii) Bulb

- Presence of reducing sugars translocated from aerial leaves, for storage to be stored.
- Absence of starch because fleshy leaves of the bulb do not store starch (Stores Volatile oils)

Aerial leaves

- Presence of reducing sugars due to photosynthesis
- Absence of starch because the reducing sugars had not been converted into starch.