

FORM FOUR CLUSTER KCSE MODEL 7

BIOLOGY PAPER 2 QUESTIONS

SECTION A (40 Marks)

Answer all the questions in the spaces provided

1. A normal man has children with a hemophilic woman. Their son Peter marries and has children with a hemophilic carrier woman.

a) i) In the space below do a genetic cross using suitable symbols to show what percentage of Peter's children are hemophiliac.

ii) Why do more men suffer from hemophilia than women?

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b) Identify two ways in which blood group inheritance in humans contradicts with Mendel's findings and conclusion in his monohybrid equipments.

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2. a) The table below shows the difference in air breathed in and out in a mammal.

Account for the difference between:

| Gas | Inhaled air | Exhaled air |
|-------------------|-------------|-------------|
| Oxygen | 21.0 | 16.00 |
| Carbon (IV) Oxide | 0.04 | 4.0 |
| Nitrogen | 79.0 | 79.0 |

i) Percentage oxygen breathed in and breathed out.

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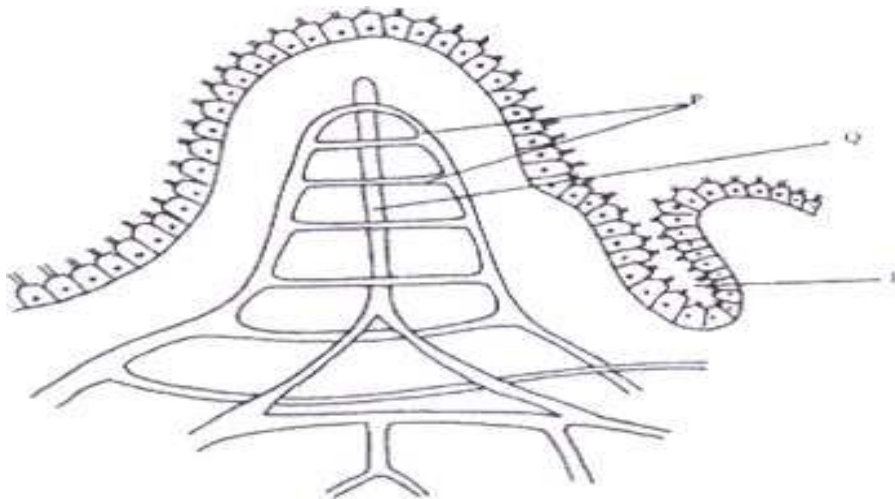
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ii) Percentage carbon (IV) oxide in and breathed out.

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b) Write down adaptations of the alveoli to their functions.

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Study the diagram below and answer the questions that follow.



a) Identify the structure and state its functions

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b) i) Name the parts labelled P and Q

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ii) State the role of the part labelled R

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(c). How is the structure stated in (a) above adapted to its functions.

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(d). What is the role of enzyme enterocinase in digestion.

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3. a) Name the type of circulatory system found in members of the class insect

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b) Name the blood vessels that transport blood from:

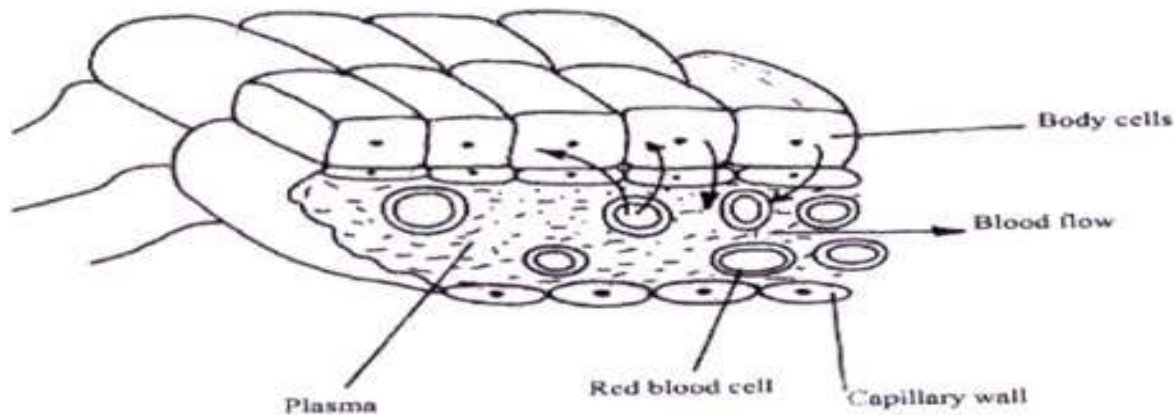
i) Small intestines to the liver

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ii) Lungs to the heart

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c) The diagram below shows gaseous exchange in tissues



i) Name the gas that diffuses

a) To the body cells

(b). From the body cells.

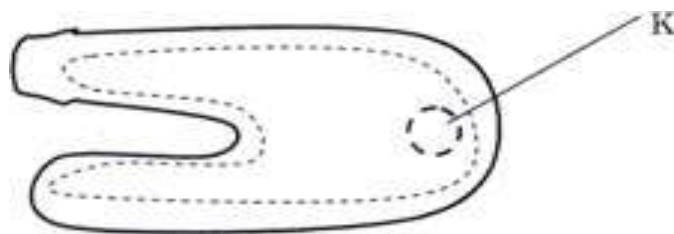
(ii). Which compound dissociates to release the gas names in (c) (i) above.

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(d). What is tissue fluid. (2 marks)

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4. A student observing pond water whose drop was placed on a slide, under high power, drew the diagram below.



(a).(i). If the eyepiece lens magnification used in the microscopy was X 10 and the total magnification was X400, work out the objective lens magnification. (2 marks)

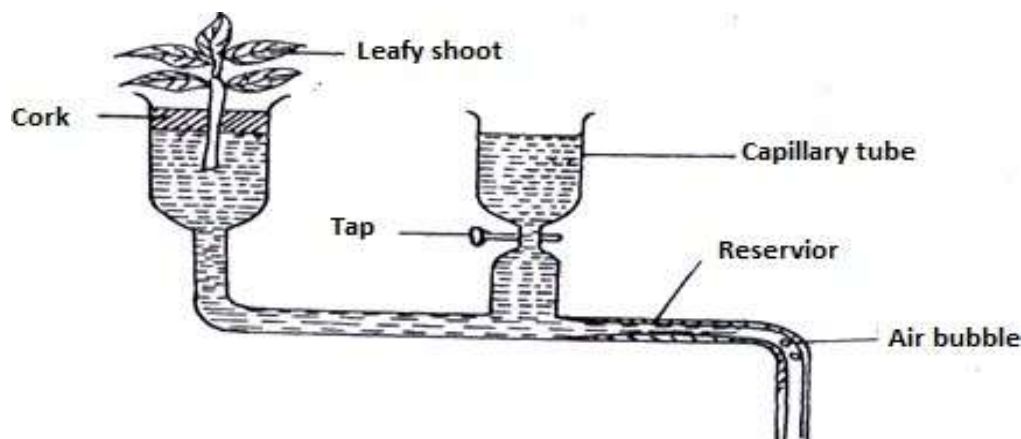
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(ii). State the function of structure K in the organism.

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(b). Study the diagram below.

5. Twelve twigs of approximately the same age, leaf surface area from the same species of plant were used in an experiment as shown below.



The twigs were treated in three groups of four. The twigs from each group were treated simultaneously as follows.

Group R -Twigs fanned using electric fans.

Group S -Twigs completely covered with polythene bags.

Group T -Twigs placed in still air in the open.

The table below is a summary of the means of four readings in each group represented as R, S and T.

| Time of day | Means of readings | | |
|-------------|-------------------|---------|---------|
| | Group R | Group S | Group T |
| 0.8.00 | 2.0 | 2.0 | 2.0 |
| 0.9.00 | 3.0 | 2.4 | 2.5 |
| 10.00 | 4.2 | 2.6 | 3.4 |
| 11.00 | 5.4 | 2.7 | 4.4 |
| 12.00 | 7.1 | 2.8 | 5.5 |
| 13.00 | 9.6 | 2.9 | 7.0 |
| 14.00 | 13.6 | 2.9 | 9.5 |
| 15.00 | 16.6 | 2.9 | 11.5 |
| 16.00 | 18.1 | 2.9 | 13.0 |
| 17.00 | 19.0 | 3.0 | 13.6 |
| 18.00 | 19.5 | 3.1 | 13.9 |

Using suitable scale on the same set of axes plot the curves of the mean volume of water in cm³ against time for the groups R, S and T.

. (a) i. (Mg = object ions mg x eye piece mg).

$$\frac{x400}{x10} \approx 40;$$

(ii). (Contractile vacuole) – removal of excess water.

(b)(i). Bryophyta;

(ii). They show alternation generation;

Has leaf like thalus;

b (iii). A –Spores;

B -Sporengiophore;

(iv). For anchorage

Absorption of H₂O and nutrients;

(b). R -The volume of H₂O transpired increase with marase with time; this due fanning carrying away water (vapour cheating diffusion gradient; (hence speeding up the rate of transpiration.)

S – The water loss remain almost constant; this due to retainion of water vapour in the polythene bag reducing the diffusion gradient;hence low rate of transpiration.

(4 marks max 3 marks)

(e). Potometer;

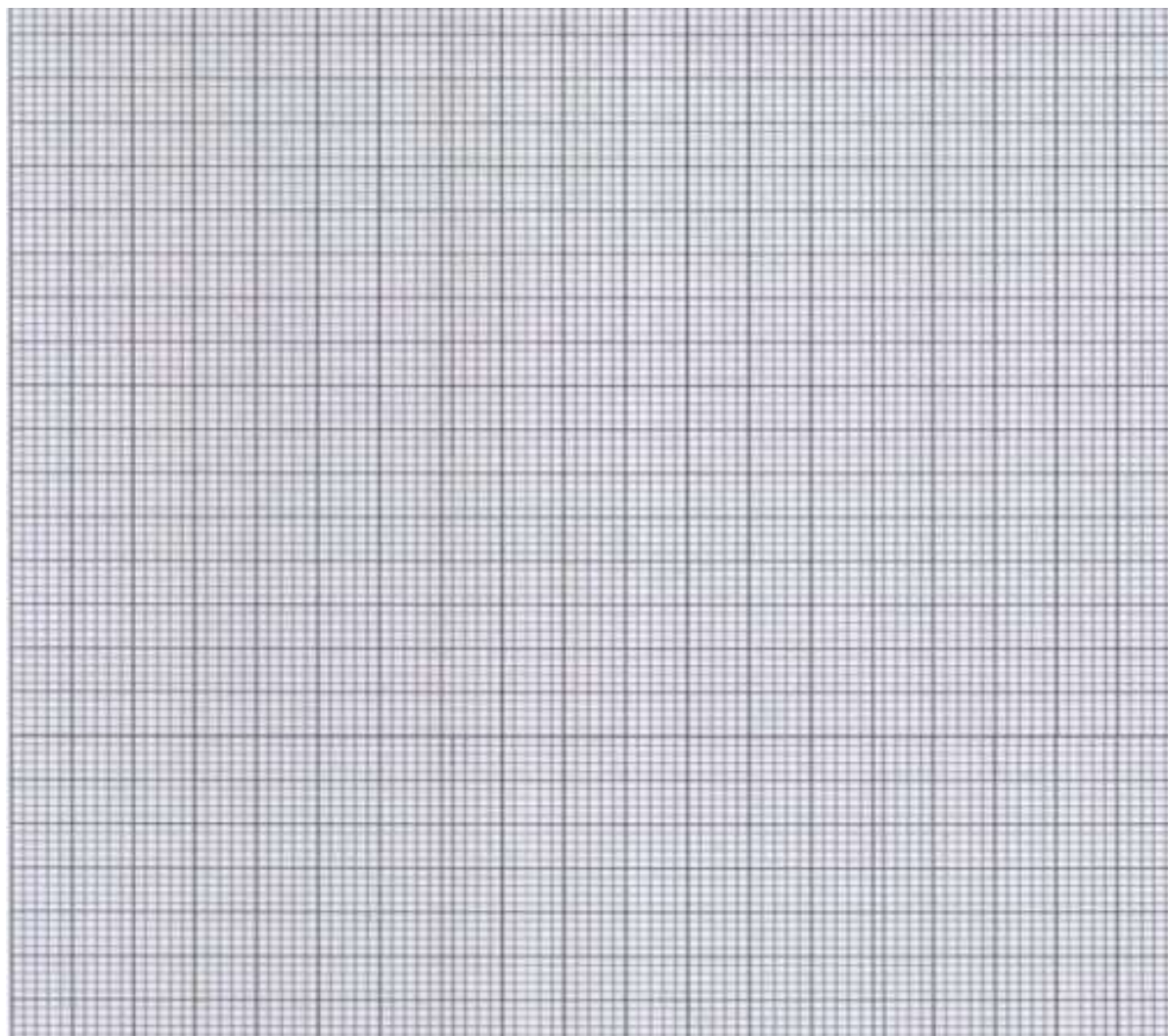
d)(i). Cut the shoot under the water;

Avoid air bubble in the capillary tube;

SECTION B (40 Marks)

Answer questions 6 (compulsory) and either question 7 or 8 in the spaces provided

after question 8. 5 6. Using suitable scale on the same set of axes plot the curves of the mean volume of water in cm³ against time for the groups R, S and T.



(b). Account for the shapes of R and S

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(c). Name the apparatus used in this experiment.

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(d). (i). State two precautions that should be taken when setting up the experiment.

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(ii). Give a reason for each precaution stated in (d)(i) above.

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(e). What is the significance of transpiration to a plant.

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(f). Other than the factors being investigated in this experiment, name two other environmental factors that affect the rate of transpiration.

7. (a). Distinguish between chemical evolution and organic evolution

(b). Darwin put forward his explanation based on a concept we call Natural selection.

Explain his concept.

8. (a). Explain how a mesophyte leaf is suited to its photosynthesis function.

(b). Describe the structure and functions of the various parts of a wind pollinated flower.