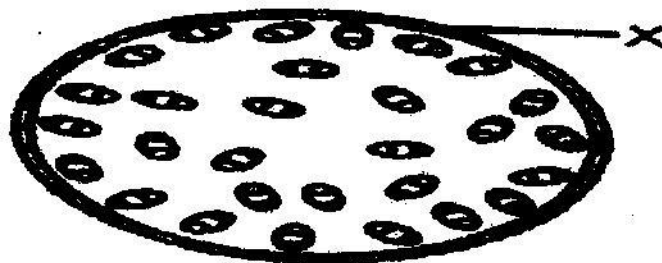


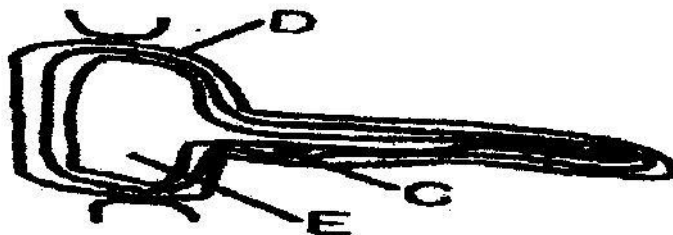
K.C.S.E YEAR 2010

PAPER 1

1. State the name give to the study of:
 - a) The cell (1 mark)
 - b) Micro--organism. (1 mark)
2. The diagram below shows a transverse section of a plant organ.



- a) Name the plant organ from which the section was obtained. (1 mark)
 - b) i) name the class to which the plant organ was obtained (1 mark)
 - ii) Give a reason for your answer in (b) (i) above (1 mark)
 - c) Name the part labeled X. (1 mark)
3. State the function of:
 - a) Ribosomes (1 mark)
 - b) Lysosomes (1 marks)
4. The diagram below shows a specialized plant cell.



- a) i) Name the cell (1 mark)
 - ii) Name the parts labeled **D** and **E**. (2 marks)
 - b) state the function of the part labeled **C**. (1 mark)
5. state three ways in which a respiratory surface is adapted to its function. (3 marks)
6. State one function for each of the following:
 - a) Cerebellum (1 mark)
 - b) Medulla oblongata (1 mark)
7. Distinguish between haemolysis and plasmolysis. (2 marks)
8. State three external differences between chilopoda and diplopoda. (3 marks)
9. State **two** ways in which chlooplasts are adapted to their functiuons. (2 marks)
10. State two advantages of hybrid vigour. (2 marks)



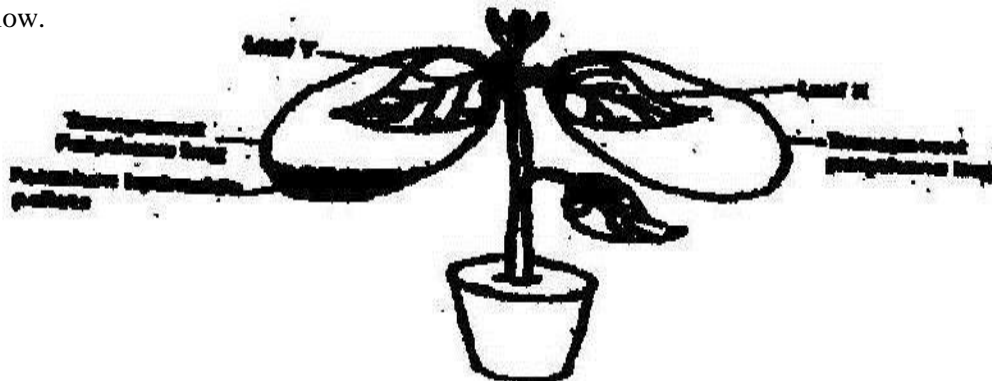
11. The diagram below shows a transverse section of leaf.



- Name the habitat of the plant from which the leaf was obtained. (1 mark)
 - Give one reason for your answer in (a) above. (2 marks)
12. The diagram below illustrates the structure of bread mould.



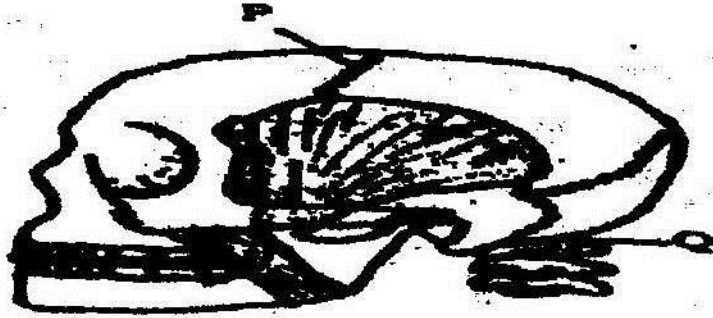
- Name the part labeled J (1 mark)
 - State the function of the structure labeled K (2 marks)
13. What is meant by the following term?
- Habitat; (1 mark)
 - Ecosystem (1 mark)
14. Explain why is not advisable to be in a poorly ventilated room with a burning charcoal. (3 marks)
15. A potted plant was kept in the dark for 48 hours. Two leaves X and Y were treated as shown in the diagram below.



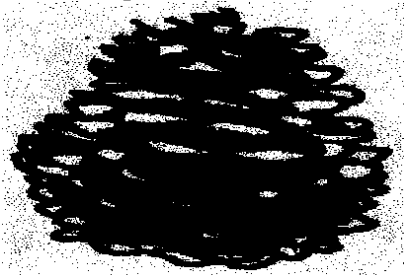
- The experimental set-up was kept in sunlight for 6 hours after which a starch test was carried out on the two leaves.
- What were the results of the starch test on leaves X and Y? (2 marks)
 - Give reasons for your answers in (a) above. (2 marks)
16. What is the role of bile salts in humans? (2 marks)
17. The following is the dental formula of a certain mammal:
- $$\begin{matrix} i & 0/3 & c & 0/1 & pm & 3/3 & m & 3/3 \end{matrix}$$
- State the likely mode of feeding for the mammal. (1 mark)
 - Give a reason for your answer in (a) above. (1 mark)



18. Give **two** reasons why animals have specialized organ for excretion as compared to plants (2 marks)
19. State the changes that occur in arterioles in the human skin during thermoregulation. (2 marks)
20. State **two** advantages of internal fertilization in humans. (2 marks)
21. The diagram below represents part of the human skeleton.



- a) Name the part labeled **P** (1 mark)
- b) i) Name the bone the articulates with the part labeled **Q**. (1 mark)
- ii) What type of joint is formed between the part labeled **Q** and the bone named in (b) (i) above?(1mk)
22. What is the function of the following structure in the human reproductive organ?
- a) Fallopian tubes. (1 mark)
- b) Epididymis. (1 mark)
- c) Scrotal sac (1 mark)
23. Explain **three** ways in which red blood cells are adapted to their function. (3 marks)
24. .
- a) State **two** ideas proposed by Lamarck in his theory of evolution. (2 marks)
- b) Why is Lamarck's theory not acceptable? (1 mark)
25. State **three** factors that contribute to the deceleration phase in the population curve of an organism (1 mark)
26. State **one** survival value for each of the following in plants:
- a) Thigmotropism in stems; (1 mark)
- b) Geotropism in roots. (1 mark)
27. .
- a) What is meant by the term non-disjunction? (1 mark)
- b) Give an example of a genetic disorder caused by:
- i) Non-disjunction; (1 mark)
- ii) Gene mutation (1 mark)
28. State **three** structural differences between arteries and veins. (3 marks)
29. The diagram below represents a female cone.



- a) Name the subdivision of the plant from which the cone was obtained. (1 mark)
- b) Other than the presence of cone, name **two** other external features that identify plants in the subdivision named in (a) above. (2 marks)
20. What is meant by the apical dominance? (3 marks)



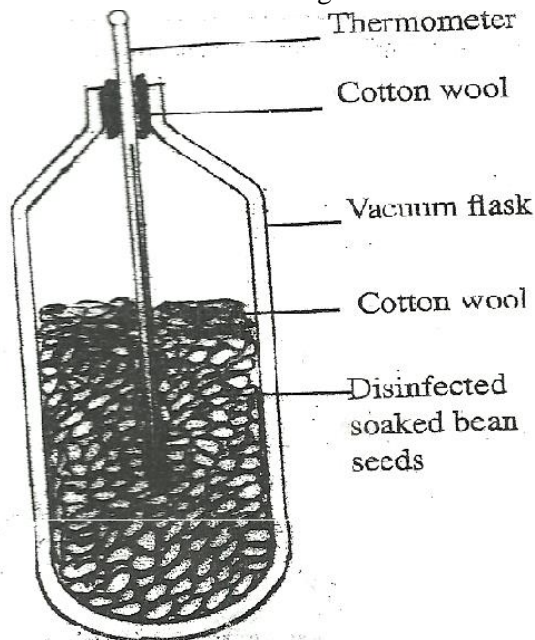
K.C.S.E YEAR 2010

PAPER 2

SECTION A (40 MARKS)

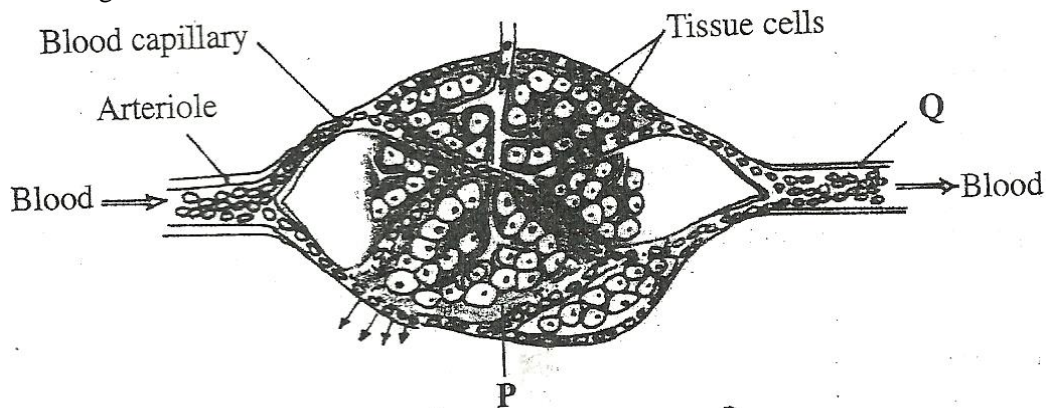
Answer all the questions in this section in the spaces provided.

1. In an experiment, disinfection soaked bean seeds were put in a vacuum flask which was then fitted with a thermometer as shown in the diagram below.



The temperature readings were taken every morning for three consecutive days.

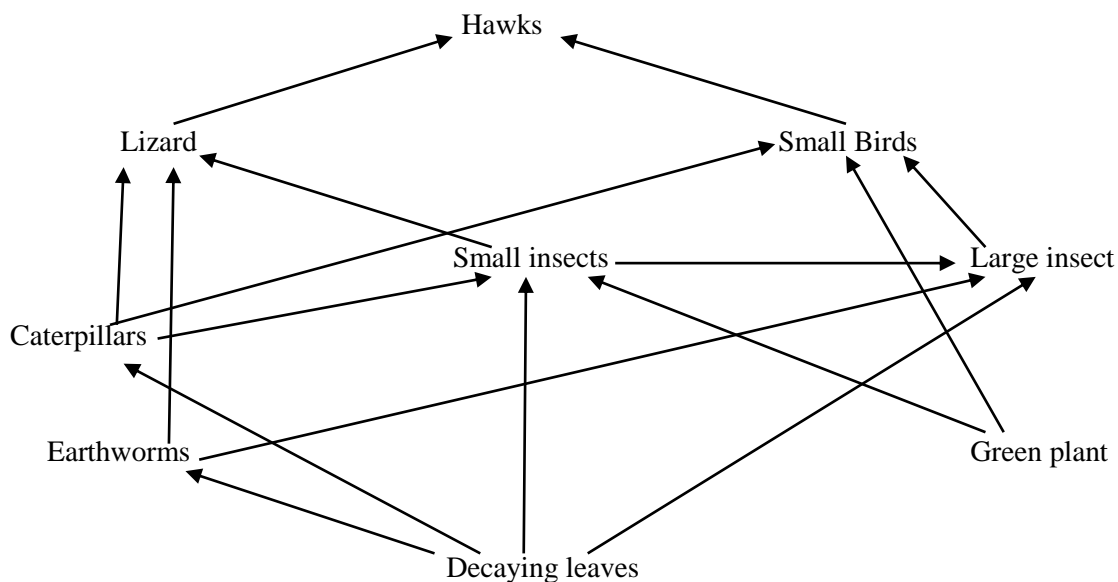
- Which process was being investigated? (1 mark)
 - what were the expected results? (1 mark)
 - account for the answer in (b) (i) above? (2 marks)
 - Why were the seeds disinfected? (2 marks)
 - Why was a vacuum flask used in the set-up? (1 mark)
 - How would a control for this experiment be set? (1 mark)
2. The diagram below shows blood circulation in a mammalian tissue.



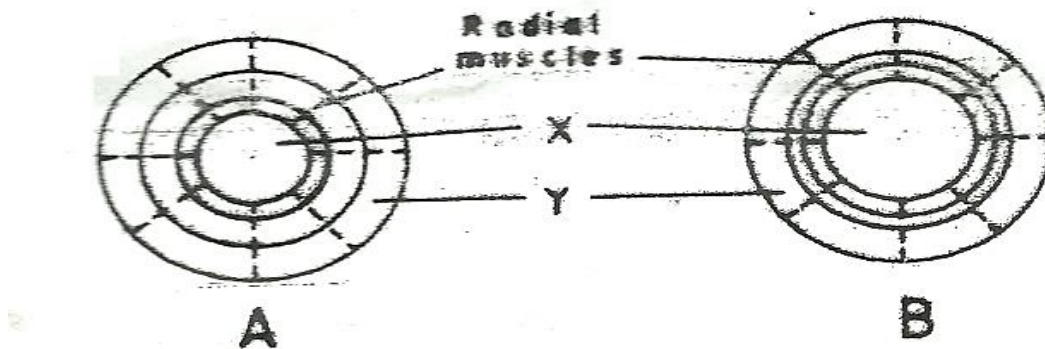
- Name the part labeled **P** and **Q** (2 marks)
- Name the substance that are:



- i) Required for respiration that move out of capillaries; (2 marks)
 - ii) Remove from tissue cells as a result of respiration (2 marks)
 - c) Explain how substances move from blood capillaries into the tissue cells. (2 marks)
 - d) Name **one** component of the blood that is not found in the part labeled **P** (1 mark)
3. The diagram below represents a food web in certain ecosystem



- a) Name the trophic level occupied by each of the following:
 - i) Caterpillars (1 mark)
 - ii) Small insect. (1 mark)
 - b) From the food web, construct **two** food chains which end with lizards as a tertiary consumer. (2 marks)
 - c) i) Which organisms have the least biomass in this ecosystem? (1 mark)
 - ii) Explain the answer in (c)(i) above. (3 marks)
4. The diagram below shows how the iris and pupil of a human eye appear under different conditions.



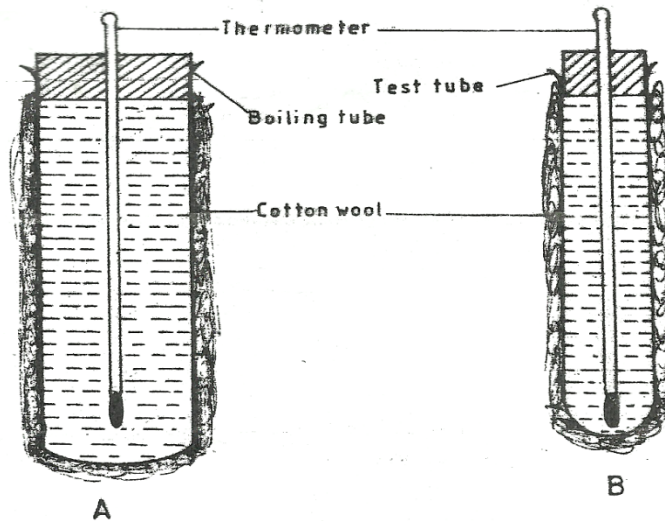
- a) Name the structures labeled **X** and **Y** (2 marks)
 - b) i) State the condition that leads to the change in appearance shown in the diagram labeled **B** (2 marks)
 - ii) Describe the change that lead to the appearance of the iris and pupil as shown in the diagram labeled **B**. (4 marks)
 - iii) What is the significance of the change described in (b) (ii) above? (1 mark)
5. When pure breeding black guinea pigs were crossed with pure breeding white guinea pigs, the offspring had a coat with black and white patches.



- a) Using letter G to represent the gene for black coat colour and letter H for white coat colour, work out the genotypic ratio of F₂.
- b) State the phenotypic ratio of F₂. (1 mark)
- c) i) Name the term used when two alleles in heterozygous state are fully expressed phenotypically in an organism. (1 mark)
- ii) Give an example of a trait in human beings where the condition whose term is named in (c) (i) above expresses itself. (1 mark)

Answer question 6 (**compulsory**) and either question 7 and 8 in the space provided after question 8

6. In an experiment to investigate a certain physiological process, a boiling tube labeled **A** and a test tube labeled **B** were covered with cotton wool. The two tubes were simultaneously filled with hot water and fitted with thermometers. The experimental set-up was as in the diagrams below.



The temperatures reading were taken at the start and after every two minutes for twenty minutes. The results were as shown in the table below.

Time (minutes)	Temperature (°C)	
	Boiling tube A	Test tube B
0	60	60
2	59	54
4	57	50
6	55	46
8	53	43
10	52	40
12	51	37
14	49	35
16	48	33
18	47	32
20	46	30

- a) Using the same axes, draw graphs of temperature against time. (6 marks)



- b) i) Work out the rate of heat in the boiling tube labeled **A** and test tube labeled **B** between the 5th and 15th minutes.
 - ii) Account for the answers in (b) (i) above. (2 marks)
 - iii) How does the explanation in (b) (ii) above apply to an elephant and a rat? (2 marks)
 - c) i) State the role of the cotton wool in this experiment. (1 mark)
 - ii) Name **two** structures in mammals that play the role stated in (c) (i) above (2 marks)
 - d) State **three** advantage of having constant body temperature in mammals. (3 marks)
7. Describe the process of fertilization in flowering plants. (20 marks)
8. Describe how a finned fish such as Tilapia moves in water. (20 marks)

