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

BIOLOGY

FORM FOUR

TIME:2 HOURS

KCSE TOP PREDICTION MASTER CYCLE 8

INSTRUCTIONS TO CANDIDATES:

- *.Write your **name, index number, admission number**, **school** and **stream** in the spaces provided above.*
- ***Sign** and write the **date of examination** in the spaces provided above.*
- *You are required to spend the first 15 minutes of the $1^3/4$ hours allowed for this paper reading the whole paper carefully before commencing your work.*
- *Answer **ALL** the questions in this paper in the spaces provided.*
- *Candidates **should** answer the questions in English.*

FOR EXAMINER'S USE ONLY

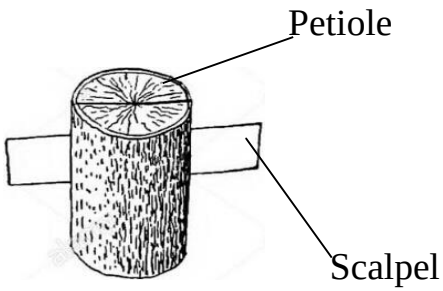
Question	Maximum score	Candidate's score
1	16	
2	12	
3	12	
Total	40	

This paper consists of 8 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing

1. You are provided with **Specimen A, Solution X** and **Solution Y.**

(a) Cut out a cylindrical portion of the petiole from **Specimen A** measuring 5cm long (reserve the leaves for **part b** of the question). Make a longitudinal section through the petiole so as to divide it into two identical straight halves as shown below;



Place one straight half of the petiole into the boiling tube containing **solution X**, and label the tube as **Set up I.** Place the other straight half of the petiole into the boiling tube containing **solution Y**, and label the tube as **Set up II.** Leave the two set ups to stand for 30 minutes.

Remove the two halves of the petiole from the solutions and examine them.

(i) Account for the curvature of half of the petiole in **set up I**. (***5marks)***

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(ii) Based on your observation of the curvature of half of the petiole in **set up II**, state the nature of **solution Y** in relation to plant cells. (***1mark)***

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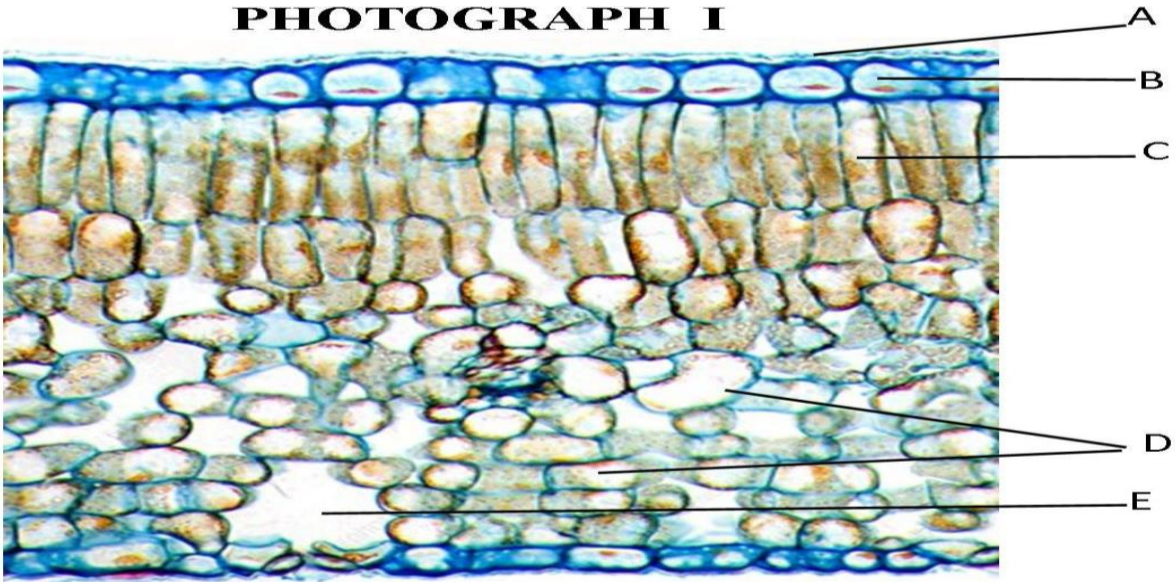
(b) Cut the leaves of specimen A into small pieces and place them into a mortar. Add 10ml of distilled water, then grind them using a pestle so as to obtain an extract called **solution R**. Using the reagents provided, carry out various tests using the procedures in the table below to determine the food substances in the solution R. In each case, state the observation and conclusion made. ***(6 marks)***

Food substance	**Procedure**	**Observation**	**Conclusion**
Proteins	-Place 2ml of solution R into a test tube. - Add equal amount of NaOH solution. -Add $CuSO_4$ solution dropwise and shake		
Reducing sugars	-Place 2ml of solution R into a test tube. -Add equal amount of Benedict's solution. -Boil the mixture.		
Vitamin C	-Place 2ml of DCPIP into a test tube. -Add solution R dropwise as you shake.		

(c) The **photograph I** below shows the internal structure of **Specimen A.** Study it carefully and answer the questions that follow.

PHOTOGRAPH I



(i) Identify the structures labelled A and B. ***(2marks)***

A.....

B.....

(ii) State **one** structural difference between cells C and D. (***1mark)***

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(iii) What is the function of the part labelled E ***?*** ***(1mark)***

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2. You are provided with **Specimens X, Y** and **Z.**

(a) State the type of dry, indehiscent fruit represented by **specimen X.** (***1mark)***

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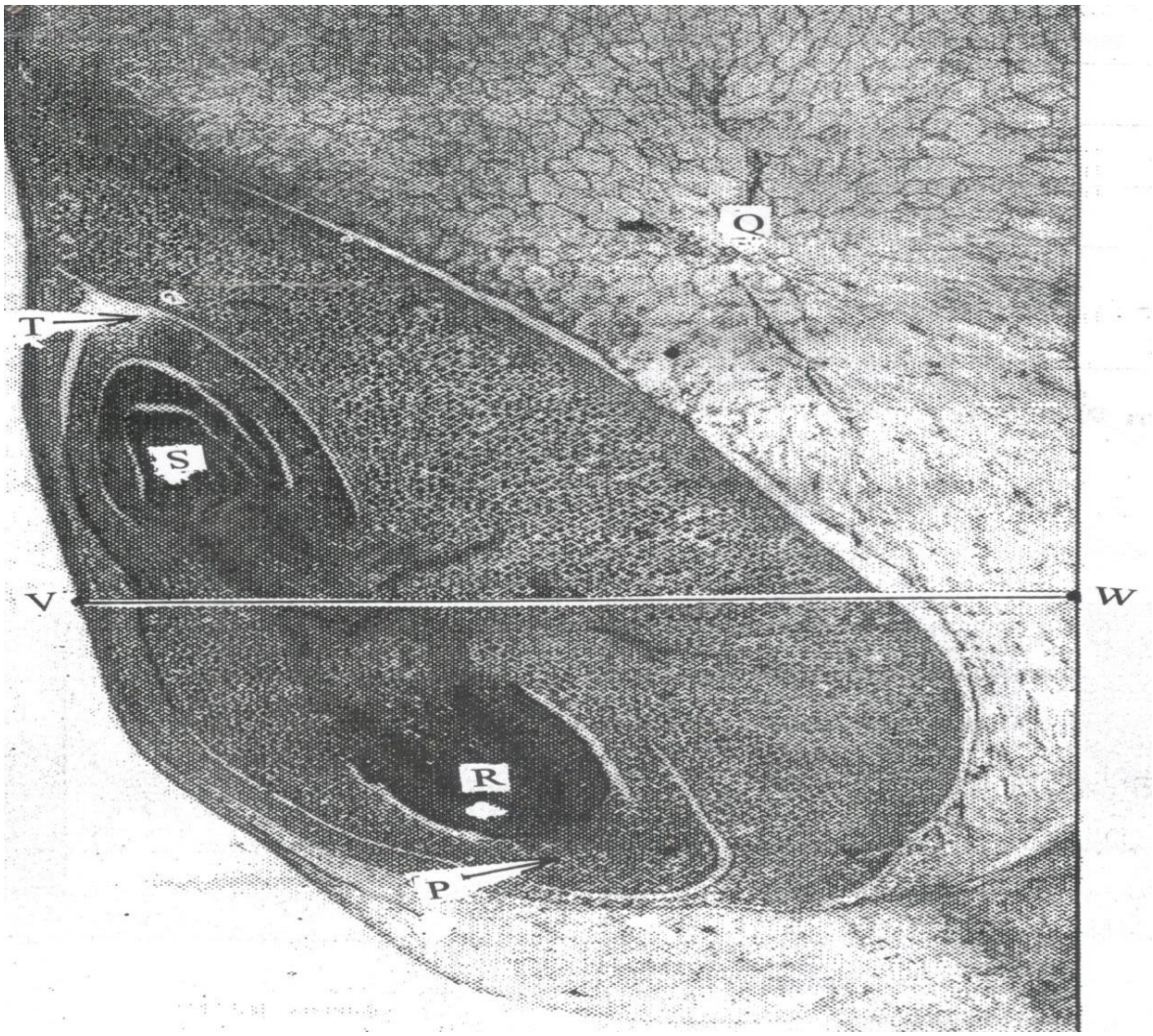
(b) With a reason, state the method of dispersal of **specimen Y**. ***(2marks)***

(i) Method of dispersal.....

(ii) Reason.....

(c) Cut **specimen Z** transversely so as to obtain two identical halves. Draw and label the cut surface of one half. (***3marks)***

(d) Below is a photograph of the internal longitudinal section of **Specimen X**.



(i) Name the parts labelled P and S. ***(2marks)***

P.....

S.....

(ii) State the function of the part labelled T**.** ***(1mark)***

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(iii) Identify the region that would stain blue black with iodine solution. (***1mark)***

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(e) The magnification of the internal longitudinal section in the above photomicrograph was X30,000. Measure the distance of the dark horizontal line between V and W in millimetres. Calculate the actual width of the section between V and W in micrometres. (***2marks)***

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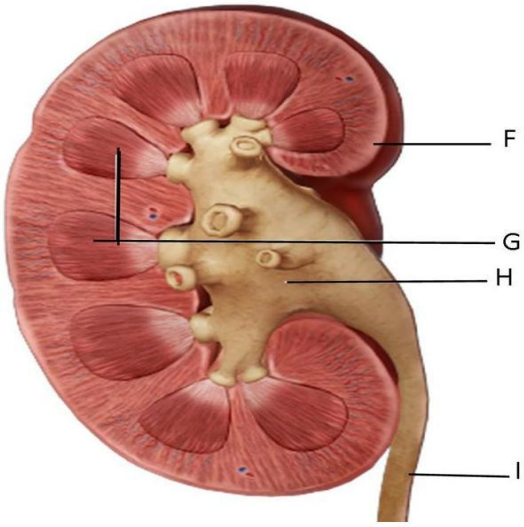
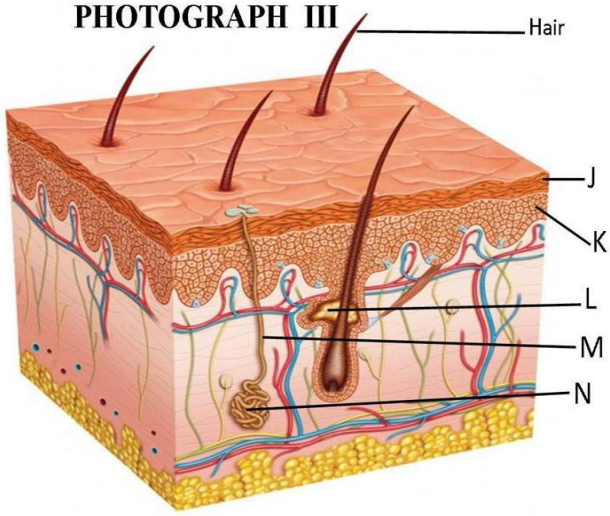
3. Below are photographs II and III of the mammalian kidney and skin respectively.

PHOTOGRAPH II



PHOTOGRAPH III



(a) Identify the layers labelled F, J and K. (***3marks)***

F.....

J.....

K.....

(b) State the function of each of the parts labelled L and M. ***(2marks)***

L .....

M.....

(c) Explain how the structure labelled N is adapted to its function. ***(1mark)***

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(d) Identify part in photograph II that contains glomeruli. ***(1mark)***

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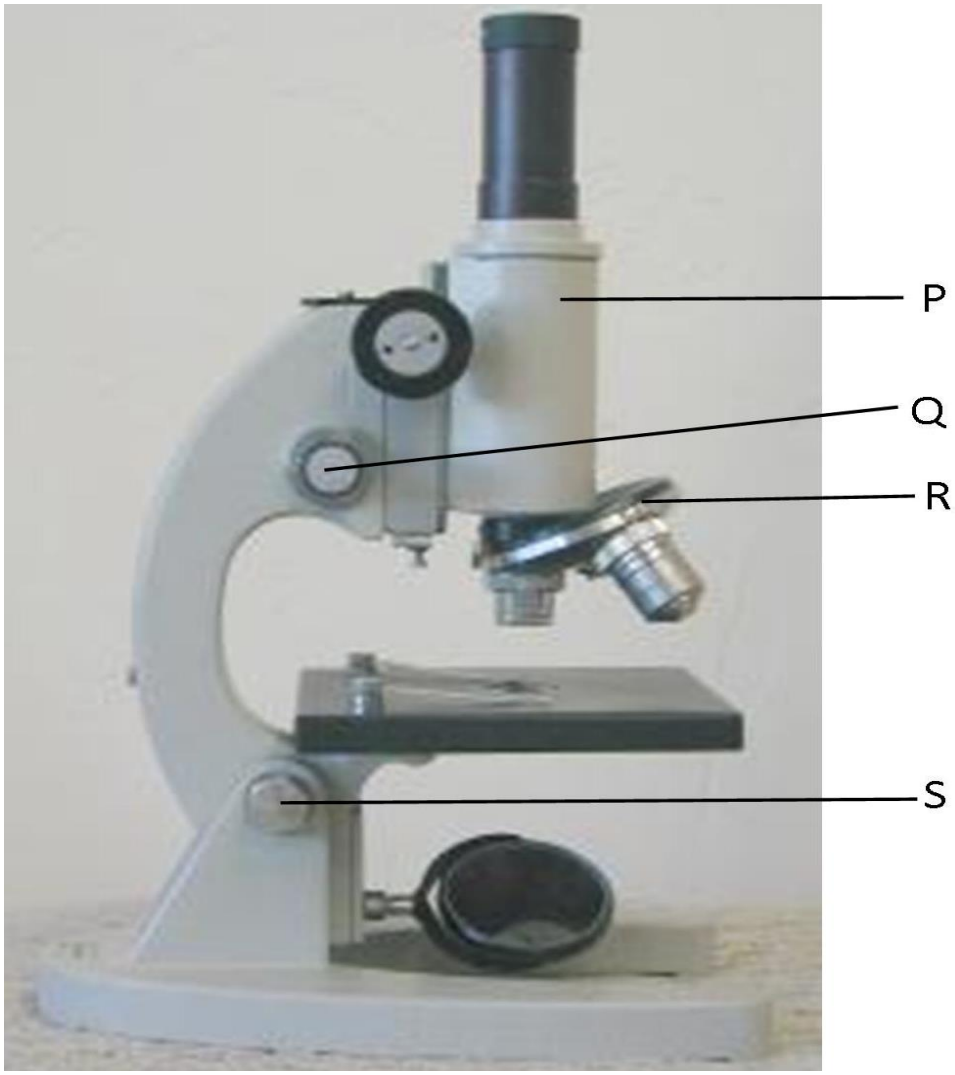
(e) The cells in the layer labelled J can be examined using the light microscope shown below.



(i) Identify on the above photograph the structure that would be adjusted to improve on the clarity of blurred images of the cells in layer J. (***1mark)***

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(ii) State the significance of using a sharp razor or scalpel to cut through layer J to obtain the cells for examination in the above microscope. (***1mark)***

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(iii) Name the part labelled S in the above microscope. (***1mark)***

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(iv) State **two** functions of the light microscope during examination of the cells in layer J. (***2marks)***

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