Name: ..... **Index No.** .....

School: ..... **Date:** ..... **Candidate's Sign** .....

231/2
BIOLOGY
PAPER 2 (THEORY)
FORM 4
MARCH / APRIL 2013
TIME: 2 HOURS

WESTERN ZONE JOINT EXAMINATION - 2013 (WEZOJE)

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES

1. Write your name, School and Index Number in the spaces provided above.
2. Sign and write the date of examination in spaces provided above.
3. This paper consist of THREE sections A, B and C.
4. Answer all the questions in section A and B (compulsory) insection C choose one question.

FOR EXAMINER'S USE ONLY

Question	Max. Score	Cand. Score
1	8	
2	8	
3	8	
4	8	
5	8	
6	20	
7/8	20	
Total		

This paper consists of 8 printed pages.
Candidates should check the question paper to ensure that all pages are printed as inticated an no questions are missing.

SECTION A:

Answer all questions in this section

1. The diagram below shows the base sequence of part of a nucleic acid strand. Observe it and answer the questions that follow.

G T T A C G C A

a) What do the above letters represent (1mark)

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b) Giving your reason identify the type of nucleic acid (1marks)

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c) Show the complementary R.N.A strand. (2marks)

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d) Haemophilia is a genetic disease which is transmitted through recessive gene linked to the X chromosome. A woman who is a carrier for the haemophilia gene married a normal man. Showing your work, work out the genotypes of their F_1 off spring (4marks)

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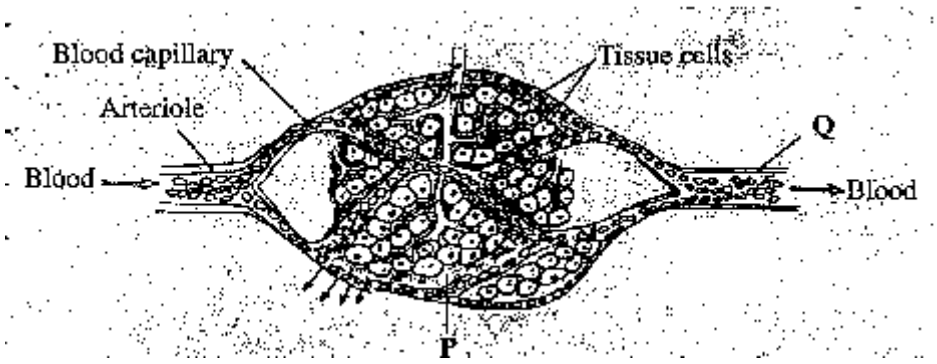
2. The diagram below shows blood circulation in a mammalian tissue



a) Name the parts labelled P and Q

P: ..... (1mark)

Q: ..... (1mark)

b) Name the substances that are

i) Required for respiration that move out of capillaries (1mark)

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ii) Removed from tissue cells as a result of respiration. (1mark)

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c) Explain how substances move from blood capillaries into the tissue cells. (3marks)

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d) Name one component of blood that is not found in the part labelled P. (1mark)

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3. The following experiment was set up to investigate the action of protease on egg white.

$2cm^3$ of water
$2cm^3$ of egg white
$2cm^3$ of protease

$4cm^3$ of water
$5cm^3$ of egg white

It was observed that after 15 minutes the contents of beaker A become clear and contents of beaker B turned cloudy.

a) Explain why contents of beaker A become clear (2marks)

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b) Explain why the contents of beaker B remained cloudy (2marks)

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c) Why was set up B included in the experiment. (1mark)

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d) Explain how temperature affects enzymatic reactions (3marks)

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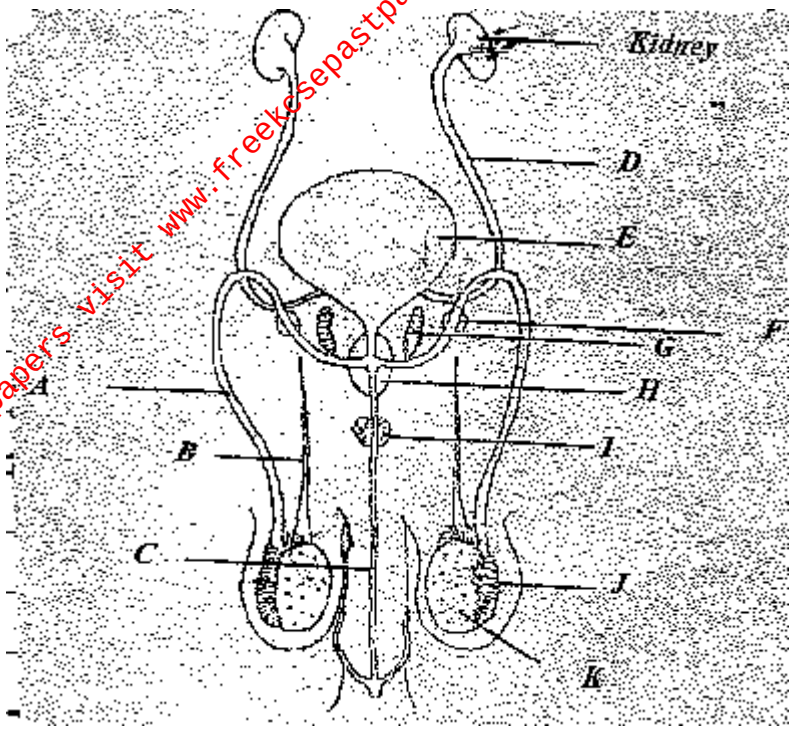
4. Shown below is a drawing of the human male reproductive system. Study the drawing and answer the questions that follow;



a) Name each of the parts B, E, J (3marks)

B: .....

E: .....

J: .....

b) Identify and name each of the parts described below;

i) Produce testosterone and other androgens, the male sex hormones. (1mark)

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ii) Secretes prostaglandins which, once in the female reproductive tract, stimulate contractions of vaginal wall to expel any residual urine in the vagina. (1mark)

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c) List **three** secondary human male sexual characteristics (3marks)

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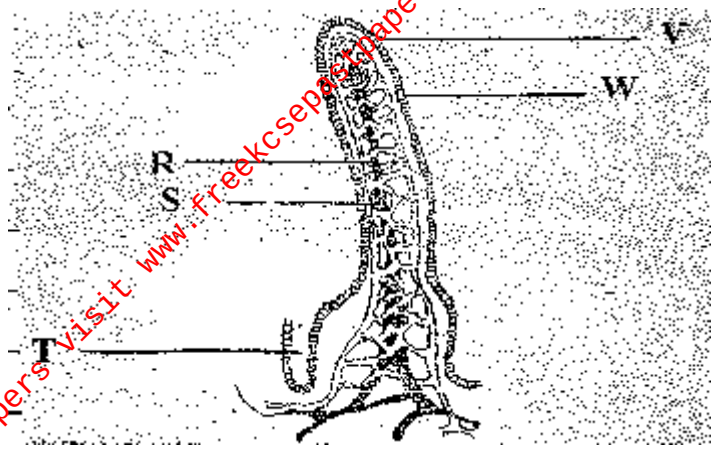
5. Shown below is a section through the human small intestine showing a villus.



a) Name each of the parts labeled PSW. (3marks)

R: .....

S: .....

W: .....

b) List **three** observable adaptive features of the villus, for absorption of food. (3marks)

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c) State how any **two** of the features in (b) above adapt the villus to its function. (2marks)

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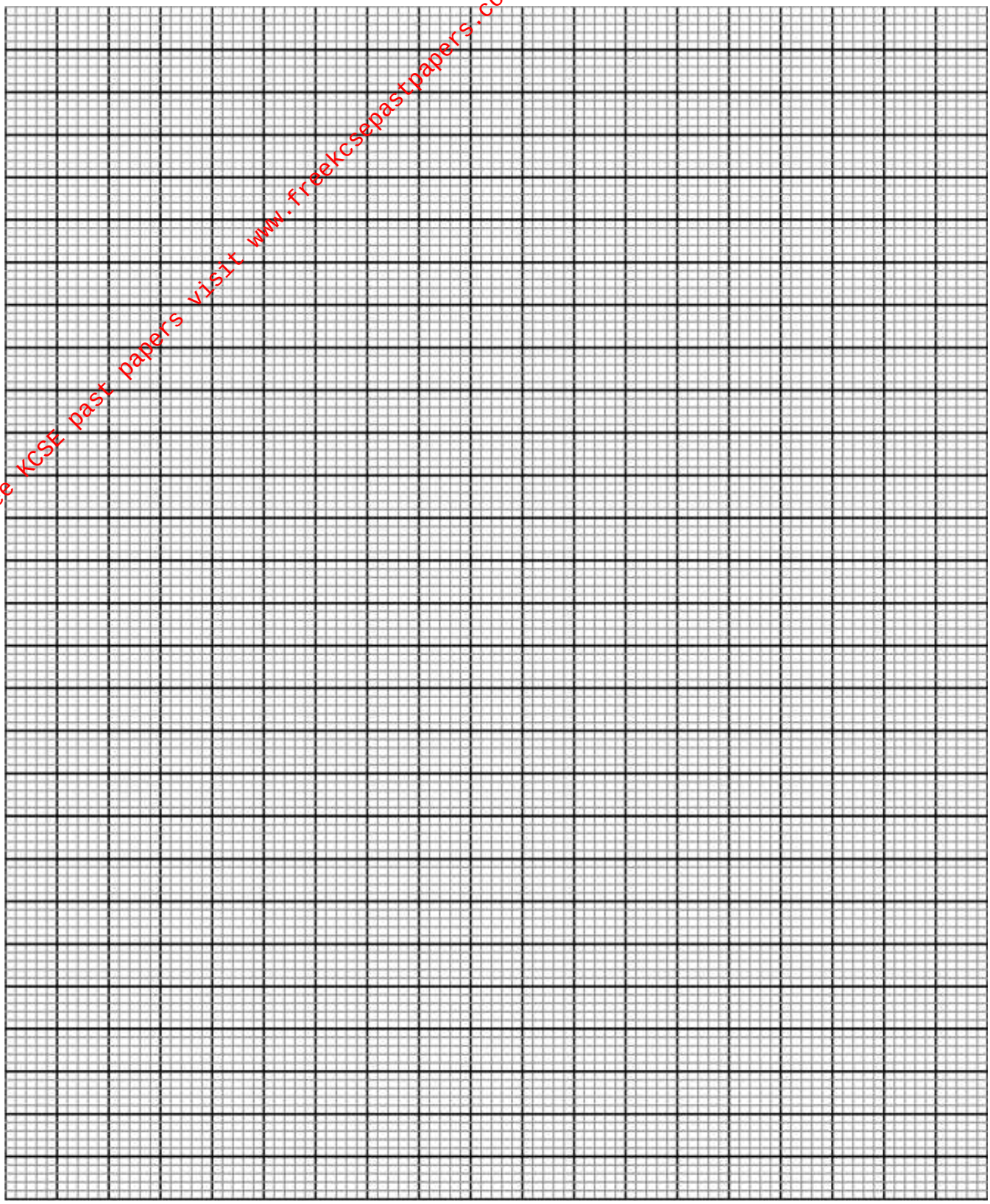
SECTION B:

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

6. The table below shows results of an experiment carried out to investigate the metabolic rate of seven mammals of the same species

Mammal	1	2	3	4	5	6	7
Metabolic rate $mm^3O_2g^{-1}h^{-1}$	1590	970	650	470	340	240	180
Body mass (kg)	100	200	300	400	500	600	700

a) Draw a graph of metabolic rate against body mass. (6marks)



b) i) What conclusion can be made from the results of this experiment. (2marks)

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ii) Give a reason for your answer in b(i) above. (2marks)

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c) What would be?

i) The mass of mammal whose metabolic rate is 1980mm^{3}O$_2$g^{-1}h^{-1} (2marks)

ii) The metabolic rate of a mammal whose mass is 850kg (2marks)

d) Explain why plants do not require specialized excretory organs (6marks)

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SECTION C:

Choose one question either 7 or 8.

7. Describe the structural and physiological adaptations of desert animals. (20marks)
8. Describe causes and methods of controlling water pollution. (20marks)

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