NAME: ..... INDEX NO: .....

SCHOOL: ..... DATE : .....

CANDIDATE'S SIGNATURE:.....

231/2
BIOLOGY
PAPER 2
(THEORY)
JULY / AUGUST 2016
TIME: 2 HOURS

- 2016

FORM 3

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

BIOLOGY

PAPER 2

TIME: 2 HOURS

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INSTRUCTIONS TO CANDIDATES:

(a) *Write your **Name** and **Index Number** in the spaces provided.*

(b) ***Sign** and write the **Date** of examination in the spaces provided.*

(c) *This paper consists of **TWO** sections **A** and **B**.*

(d) *Answer all questions in section **A** in the spaces provided.*

(e) *In section **B**, answer question **6 (compulsory)** and either question **7** or **8** in the spaces provided.*

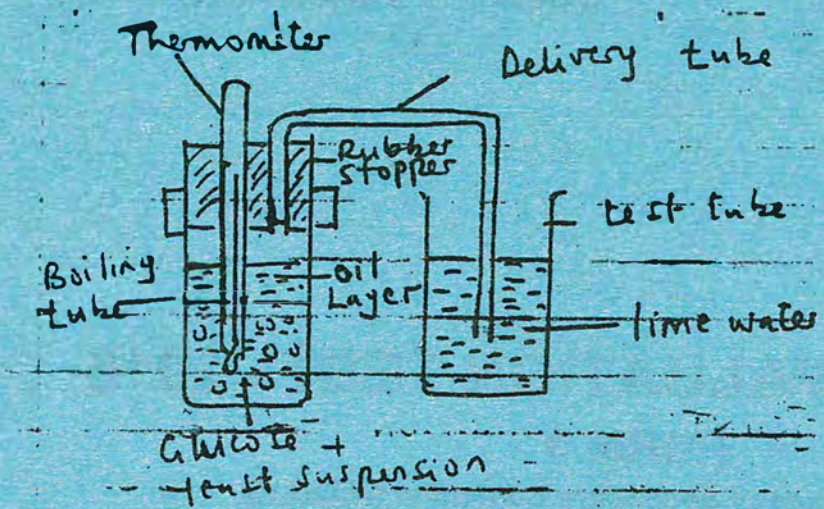
FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAX. SCORE	CANDIDATE SCORE
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
	6	8	
B	7	20	
	8	20	
	9	20	
	TOTAL	80	

SECTION A (40 MARKS)

Answer all questions in this section in the spaces provided.

1. Glucose solution was boiled and cooled to 30^0C and used in the experimental set up below.



(a) Explain the importance of the following processes:-

(i) Boiling of the glucose solution. (2mks)

.....

.....

(ii) Cooling of glucose solution to 30^0C. (2mks)

.....

.....

(iii) Covering glucose and yeast suspension with layers of oil. (2mks)

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.....

(b) What observations were made in the following:-

(i) Thermometer (2mks)

.....

.....

(ii) Lime water (2mks)

.....

.....

(iii) Account for the observation in (b) (ii) above. (2mks)

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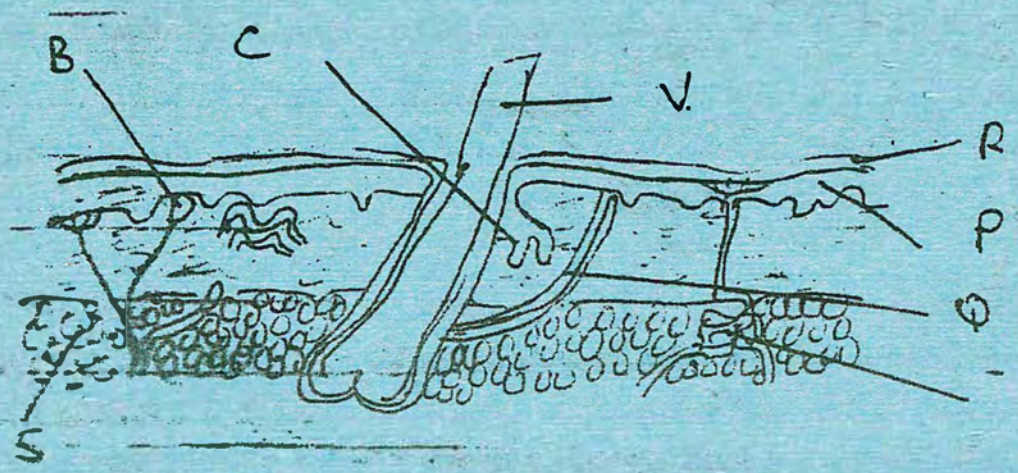
2. The diagram below represents a transverse section of the human skin. Study it and answer th questions that follow.



(a) Name the structures P, Q, R, S, T, V (6mks)

P:.....

T:.....

R:.....

S:.....

T:.....

V:.....

(b) Give the functions of each of the part labeled:

P:..... (1mk)

Q:..... (1mk)

R:..... (1mk)

(c) (i) Explain physiological changes that take place when the environmental temperature is raised gradually from 22^0C to 40^0C. (3mks)

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(ii) Give **one** advantage of the physiological change stated in (c) (i) above. (1mk)

.....

.....

(d) State **two** adverse effects of using skin lightening cosmetics. (2mks)

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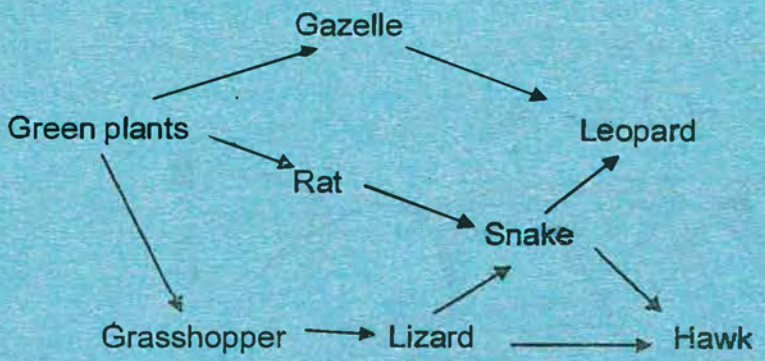
3. Study the food web below and answer questions that follow.



(a) Construct a food chain where snakes are tertiary consumers. (2mks)

(b) Name **two** organisms that are in the second trophic level. (2mks)

.....

.....

(c) State **three** effects on the ecosystem that may result should lions invade the ecosystem. (3mks)

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.....

.....

(d) Draw a possible ecological pyramid (pyramid of biomass) for the above ecosystem. (3mks)

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(e) Give the name of the organism with the least biomass in the above ecosystem. (1mk)

.....

4. (a) What is "a slide" as used in microscopy? (1mk)

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.....

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(b) Name **two** types of microscopic preparations for viewing. (2mks)

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(c) What procedure is followed when preparing a temporary slide of onion epidermal cells? (7mks)

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5. The table below shows the concentration of various ions in the cell sap of a sea weed.

Ions	Concentration of cell sap	Concentration of surrounding water
Sodium	2.3	10.6
Sulphur	0.005	3.28
Chloride	20.3	19.5
Potassium	20.12	0.46

(a) By which processer do the following ions enter the cells of the sea weed? (4mks)

Sulphur:.....

Sodium:.....

Chloride:.....

Potassium:.....

(b) Explain why when the cells of a sea weed are placed in distilled water they increase in size but when red blood cells are placed in similar water they swell and burst. (4mks)

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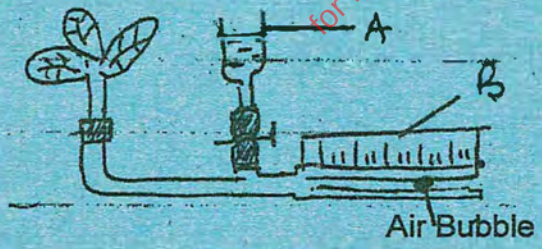
6. The apparatus below is a set-up used to demonstrate a biological phenomenon in a plant.



(a) (i) Name the apparatus. (1mk)

.....

(ii) What process is being demonstrated? (1mk)

.....

(b) Suggest the functions of: (2mks)

A:.....

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B:.....

(c) Giving a reason, state **two** precautions undertaken on the shoot to be used during this experiment above. (4mks)

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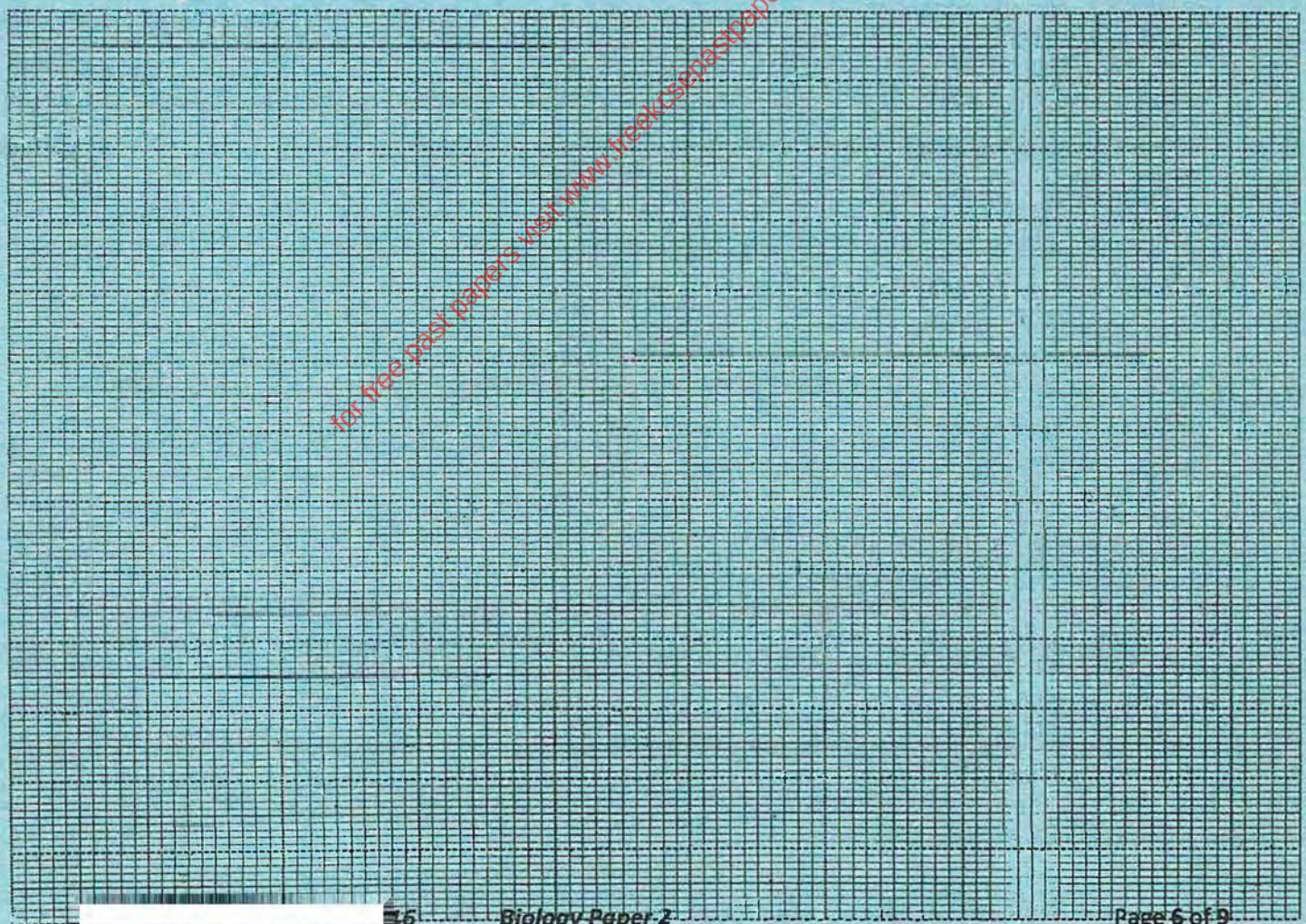
SECTION B

Answer question 7 (Compulsory) in the spaces provided after each question and either question 8 or 9 in the spaces provided.

7. The data below was obtained in an experiment to investigate the effect of changing concentration of carbon (IV) oxide on the rate of photosynthesis.

Carbon (IV) oxide concentration { $\%(10^{-2})$}	0	2	3	5	7	9	13	15	17	17
Rate of photosynthesis arbitrary units	0	39	48	54	68	78	84	90	90	90

(a) Draw a graph to illustrate the relationship between rate of photosynthesis and carbon (IV) oxide concentration. (7mks)



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(b) Explain the shape of the curve obtained. (4mks)

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(c) (i) What is the role of carbon (IV) oxide in photosynthesis? (2mks)

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(ii) How does your answer in c (i) above explain the shape of the curve. (2mks)

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(d) (i) State external other factors whose change would result in a change in the shape of the curve. (2mks)

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(ii) Explain the effect of temperature on the above. (2mks)

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8. Describe the structure and function of the blood. (20mks)

9. (a) Trace the path taken by urea from the organ where it is formed to the kidney. (10mks)

(b) Describe how the heart works. (10mks)

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