Name………………………………………………..   Index No…………………/…….

School……………………………………………….   Date .……………………….…

Candidate's Signature…………………….

231/2
BIOLOGY
(THEORY)
Paper 2
JULY / AUGUST 2012
Time: 2 Hours

BUTULA DISTRICT FORM FOUR JOINT MID YEAR EXAMINATIONS - 2012
Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES
- This paper consists of two sections **A** and **B**.

- Answer **ALL** questions in section **A**

- Answer question **6** (compulsory) and either question **7** or **8** in section **B**.

For Examiner's Use Only

Section	Question	Maximum score	Candidate's score
A	*1*	*8*	
	2	*8*	
	3	*8*	
	4	*8*	
	5	*8*	
B	*6*	*20*	
	7	*20*	
	8	*20*	
Total Marks		*80*	

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

SECTION A (40 MARKS)

Answer all questions in this section.

1. During an ecological study, students collected and marked 120 ants and released them. After 48 hours, the students captured another 90 ants, 20 of which had been marked previously.

   (a) How many ants were there in the compound? Show your working. (3mks)

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   (b) What are the limitations of this method in sampling animal populations. (4mks)

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   (c) State two other methods which could be used to determine the population. (1mk)

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2. In an experiment to investigate the action of pepsin on egg albumen, equal amount of paper were added to equal amount of egg albumen in different test –tubes. The test-tubes were placed in water bath at different temperature. The graph below shows the time taken for the enzymes to digest protein at each temperature.
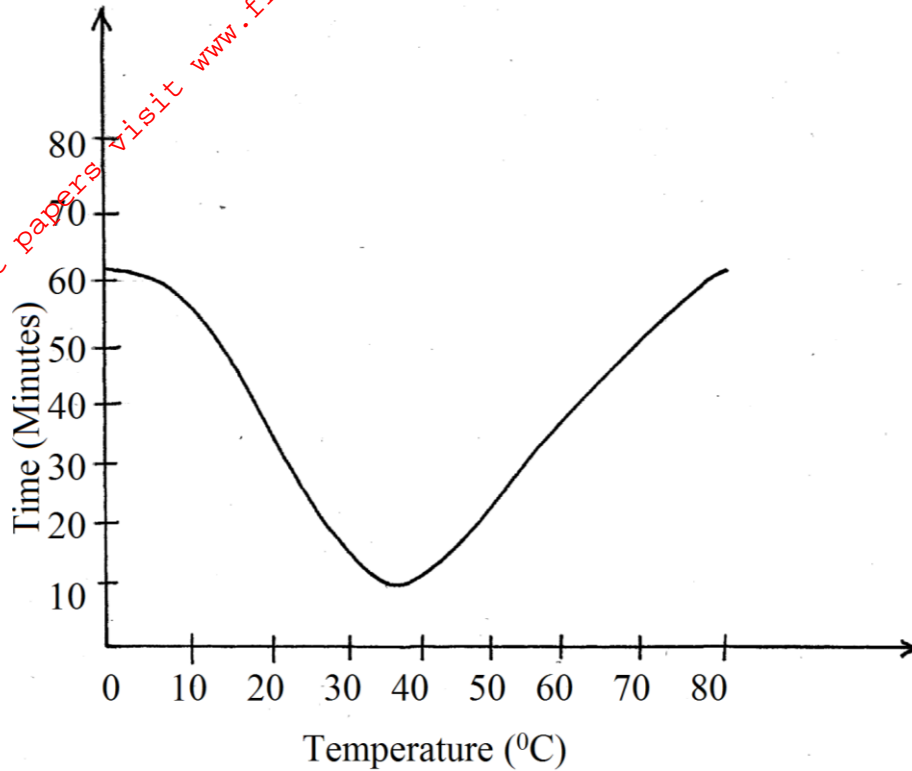
(a) What is the optimum temperature for enzymes? (1mk)

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(b) Account for the time taken to digest egg albumen at 60^0C. (2mks)

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(c) With reasons name the form in which the enzyme pepsin is secreted. (2mks)

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(d) State three other factors that affect enzyme controlled reactions. (3mks)

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3. The chart below represents the results of successive cross, starting with red-flowered Plants and write flowed plants and in which both plants are pure breeding.

Parental genotype: Red Flowers ✗ White Flowers

↓

First filial generation

│ Selfed

↓

Second filial generation

3 Red flowers : 1 White flower

(a) What are the parental genotypes? Use letter R to represent the gene for Red flower colour and r for white colour. (2mks)

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(b) (i) What was the colour of the flowers in the first filial generation? (1mk)

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(ii) Give a reason for your answer (1mk)

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(c) If 480 red flowered plants were obtained in the second filial generation, how Many F_2 plants had white flowers? Show your working. (4mks)

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4. (a) State the meaning of apical dominance in plants (1mk)

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(b) Name the hormone associated with apical dominance. (1mk)

....

(c) What is the importance of apical dominance? (1mk)

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(d)   Briefly describe the effects of the following plant growth hormones

      (i)   Gibberellins   (2mks)

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      (ii)   Abscisic Acid   (3mks)

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5.   The diagram below represents a transverse section of a leaf.
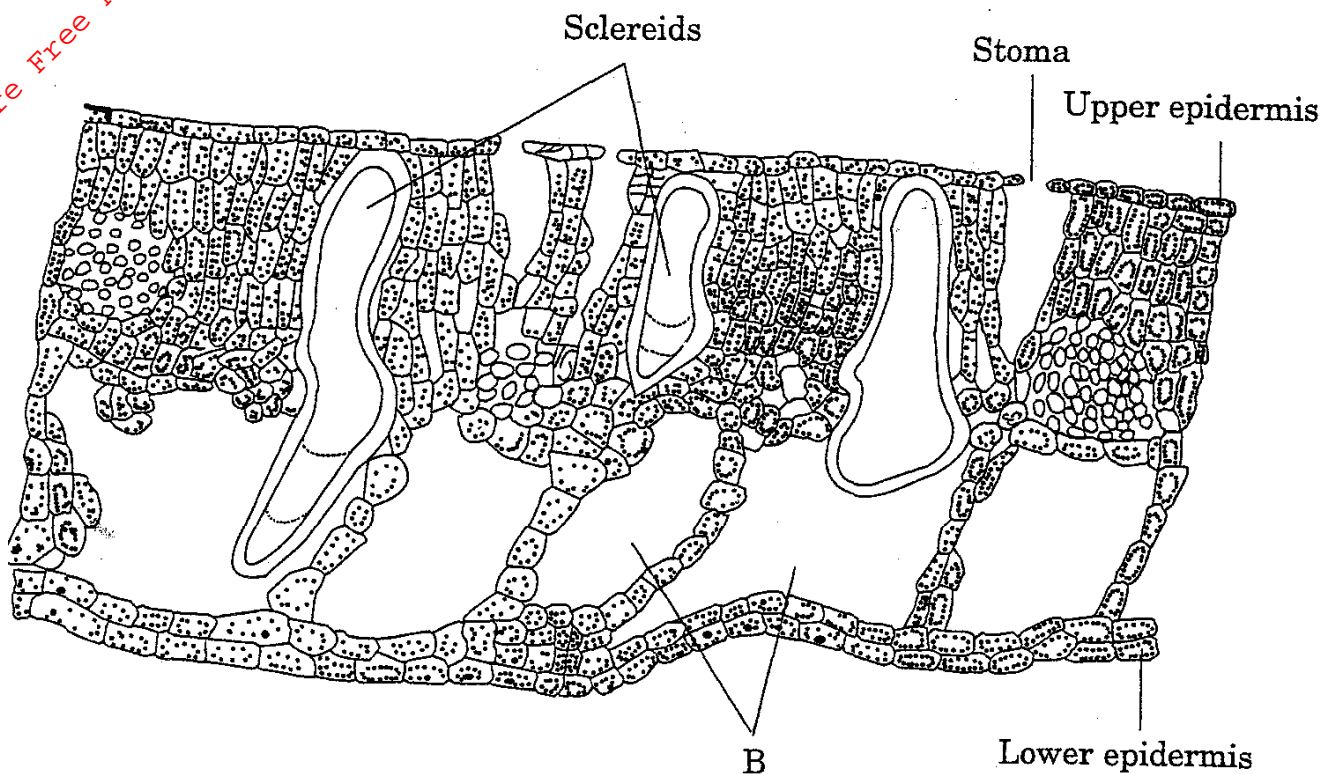
(a)   (i)   State the habitat of the plant from which the leaf was obtained.   (1mks)

....

....

      (ii)   Give two reasons for your answer in (a) (i) above.   (2mks)

....

....

(b)   How does the part labelled B adapt the plant to its habitat   (1mk)

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(c)   Smokers are always at a high risk of suffering from respiratory infections.

Explain   (3mks)

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(d)   What structures are used for gaseous exchange in plants found in marine water?   (1mk)

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SECTION B (40 MARKS)

Answer question 6 (compulsory) in the spaces provided and either

question 7 or 8 in the spaces provided after question 8.

6. Carbohydrates used during respiration and those formed during photosynthesis by a certain plant was measured over a period of 24 hours at an interval of 3 hours

Time of day	12AM	3AM	6AM	9AM	12PM	3PM	6PM	9PM	11PM
Carbohydrates formed during photosynthesis (mg)	0	0	5	30	60	30	5	0	0
Carbohydrates used during respiration (mg)	10	10	10	10	10	10	10	10	10

Using the same axes,

(a) Plot a graph of carbohydrate formed during photosynthesis and carbohydrate used during respiration against time. (7mks)

(b)   Calculate the net carbohydrate formed by the plant.   (2mks)

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(c)   At what time of the day do the light compensation points occur?   (2mks)

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(d)   Account for the shape of graph on carbohydrates.

        (i)   Between 12.00a.m and 3a.m.   (2mks)

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        (ii)   Between 3.00a.m to 12.00 noon.   (2mks)

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(e)   How could foggy weather influence the net amount of carbohydrates formed

        over the 24 hour period?   (1mk)

....

(f)   Give other external factors apart from temperature and light intensity that

        influence the rate of photosynthesis.   (2mks)

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(g)   In which form are carbohydrates stored in

        (i)   Plant bodies.   (1mks)

....

        (ii)   Fungi   (1mk)

....

7.   (a)   Define natural selection.   (2mks)

     (b)   Natural selection brings about adaptation of a species to the environment.

             Discuss.   (18mks)

8.   Discuss the adaptations of seeds and fruits to dispersal.   (20mks)

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