NAME……INDEX NO…….

SCHOOL…… SIGNATURE…….

DATE…….

231/2

BIOLOGY

PAPER 2

2 HOURS

FORM FOUR LAICOMET 2010

231/2

BIOLOGY

PAPER 2

INSTRUCTION TO CANDIDATES:

- Write your name and index number in the spaces provided at the top of this page. Sign and write the date of examination in the spaces provided
- Answer all questions in section A.
- Answer question 6 in section B and then answer either question 7 or 8
- Answers must be written in the spaces provided in the question paper. Additional paper **must not** be inserted.

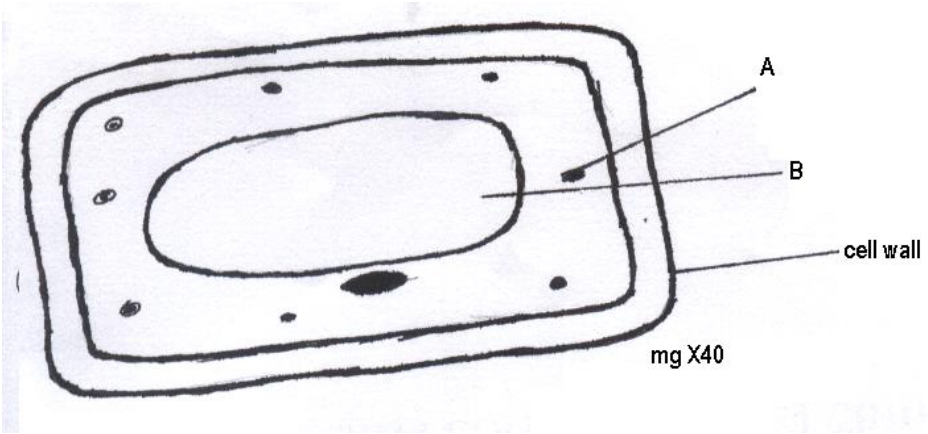
FOR EXAMINERS USE ONLY

QUESTION	MAX SCORE	CANDIDATE'S SCORE
1-5	40	
6	20	
7	20	
8	20	

SECTION A

Answer all the questions in this section in the spaces provided

1. The figure below is a diagram of a cell as seen under the light microscope. The microscope's eye piece lens had a magnification of x10



(i) Name three structure that show that this is a plant cell and not an animal cell (3mks)

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(ii) Name one chemical compound that is only found in the structure labeled A and state its function. (2mks)

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(iii) A plant growing in a waterlogged soil was found to have stunted growth and yellowing of leaves. Explain (3mks)

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2. The table below shows approximate percent concentration of various components in blood plasma entering the kidney glomerulas's filtrate and urine of a healthy human being.

component	plasma	Glomerular filtrate	urine
Water	90	90	94
Glucose	0.1	0.1	0
Amino acid	0.05	0.05	0
Plasma	8.0	0	0
proteins	0.03	0.03	2.0
Urea	0.72	0.72	1.5
Inorganic ions			

(i) Name the process responsible for the formation of glomerular fitrate. (1mk)

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(ii) Explain why there are no plasma proteins in the glomerular filtrate. (2mks)

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(iii) Why is the concentration of urea in urine much higher than its concentration in the glomerular filtrate. (2mks)

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(iv) Apart from plasma proteins, name other major component of blood that is absent in the glomerular filtrate. (1mk)

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(v) Name the process that is responsible for the absence of glucose and amino acids in urine. (1mk)

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(VI) Glucose was detected in the urine sample from a patient. Explain what would have been the cause of this condition. (1mk)

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3. If the coleoptile of an oat seedling is exposed to light coming from one side, it bends towards the light.

(a) What term is used to describe this response. (1mk)

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(b) Which hormone is involved in bringing about this response. (1mk)

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(c) What is the effect of light on this hormone. (1mk)

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(d) What would be the effect (if any) of cutting off the tip of the coleoptile and exposing the remaining portion to light from one direction. (2mks)

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(e) How is a reflex action in man different from a tropism in a plant? (1mk)

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(f) Give the significance of the two named responses in (e) above in organism. (2mks)

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4. Drosophila melanogaster (fruit fly) is an insect with complete metarmorphosis. The time between mating and emergence of adults in this fly is nine days. The adult is capable of mating after eight hours from the time it emerges from the pupa. In this fly white eye is recessive to red eye. The gene for eye colour is sex – linked. If you are given a sample of each type for the purpose of carrying out breeding experiments, one of the things to do would be obtain unmated females. Sex determination in a fruit fly is similar to that in man.

(a) (i) How would you obtain unmated flies from the sample flies. (2mks)

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(ii) How would you verify experimentally that the flies you obtained in (a) (i) above were all unmated. (2mks)

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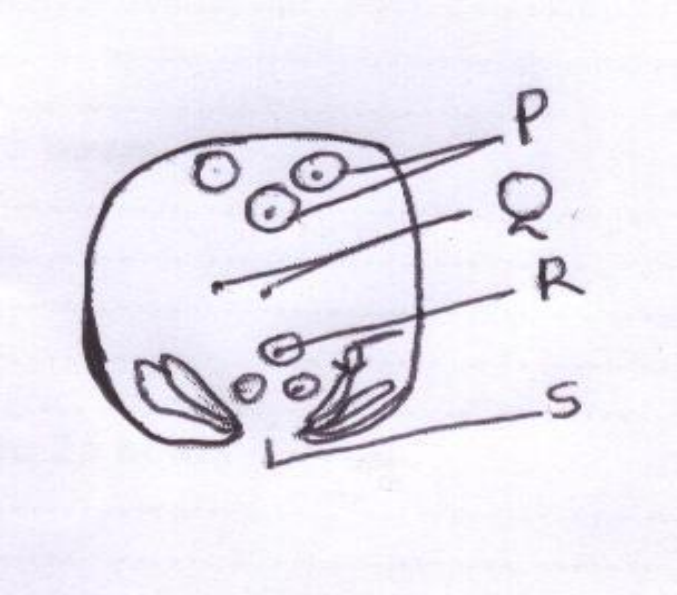
(b) If heterozygous red eyed female were crossed with a white eyed male, what would be the eye colour of their off springs and in what proportions? (Show how you arrive at your answer)

Let **R** represent gene for red eye colour and **r** to represent gene for white eyes (4mks)

5. The diagram below shows mature embryo sac



(a) Label the parts P, Q, R and S (4mks)

P……

Q……

R……

S……

(b) Insects and wind are both agents of pollination. Giving a reason suggest which one of the two is more efficient. (2mks)

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(c) Briefly explain how stigma in wind pollinated flower is adapted to pollination (2mks)

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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. A culture of bacteria was incubated in nutrient ager at 35^0c. Samples were taken at 5 hours intervals in order to estimate the number of bacteria in the population. The data obtained is shown below.

Time in hours	0	5	10	15	20	25	30	35	40	45
Number of living cells (millions)	15	25	750	1000	1000	1000	800	500	250	50

(a) On the grid provided, plot a graph of number of living cells (millions) against time in hours. (6mks)

(b) Account for the shape of the graph between

(i) 0 to 5 hours. (3mks)

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(ii) 5 hours to 15 hours. (4mks)

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(iii) 15 hours to 25 hours. (2mks)

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(c) (i) Suggest what would happen to the population of the bacteria if the temperature was lowered to $0^{o}c$ after incubating for 12 hours. (1mk)

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(ii) Give a reason for your answer in c (i) above . (1mk)

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(d) Give three reasons why it is important to control human population growth in Kenya (3mks)

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7. Trace the path followed by a molecule of glucose from the time of absorption in the ileum until it enters a muscle cell in the leg. (20mks)

8. (a) Describe causes and effects of water pollution. (10mks)
   (b) Describe the various control measures for water borne diseases. (10mks)

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