FORM FOUR CLUSTER KCSE MODEL14

BIOLOGY PAPER 2 QUESTIONS

SECTION A (40 Marks)

1. a) State three differences between monosaccharides and polysaccharides (3mks)

   b) Describe the role of the following in mammalian digestive system

   i) Saliva (1mk)

   ii) Muscles in alimentary canal (1mk)

   c) State two Functions of the ileum (2mks)

   d) Write down the human dental formula (1mk)

2. Sickle cell anaemia is a hereditary disease due to a recessive gene which changes

   normal haemoglobin HbA to abnormal haemoglobin HbS.

   The red blood cells of people with sickle cell anaemia are sickle shaped.

   a) What are the possible phenotype of the offspring of a man who is heterozygous and a woman

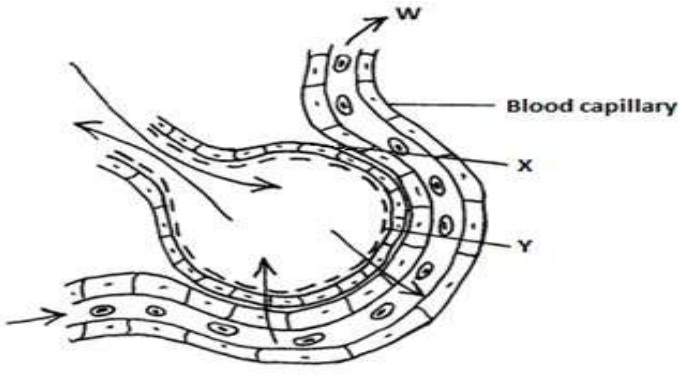
   Who is also heterozygous for sickle cell anaemia (4mks)
   b) Calculate the percentage of the offspring that would have sickle cell trait. (1mk)

   c) What is the adaptive advantage of an individual with sickle cell trait. (1mk)

   d) What do you understand by the following terms

   i) Polyploidy (1mk)
   ii) Genetic engineering (1mk)

3. The diagram below shows a specialized mammalian structure



   a) Name the structure represented by the diagram. (1mk)
   b) Name the feature labeled (2mks)

   X.....

   Y.....

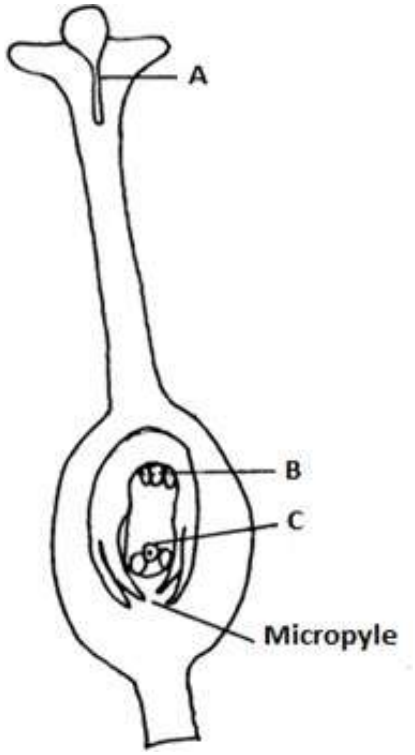
c) i) Name the process by which gases move in and out of the red blood cells (1mk)

ii) Which blood vessel receives blood leaving at point W. (1mk)

d) How are the lenticels adapted to gaseous exchange? (2mks

e) What is the significance of the counter current flow system in Fish. (1mk)

4. The diagram below shows a cross section through a female part of a flower.



a) Name parts labelled (2mks)

B.....

C.....

b) State one function of the part labelled A (1mk)
c) State the function of the micropyle (1mk)

d) i) What is the term used to describe fertilization process that occur in flowering plants (1mk)

ii) Explain briefly how the process you have named in d(i) above takes place (2mks)

e) What happens to the ovules after fertilization in plants? (1mk)

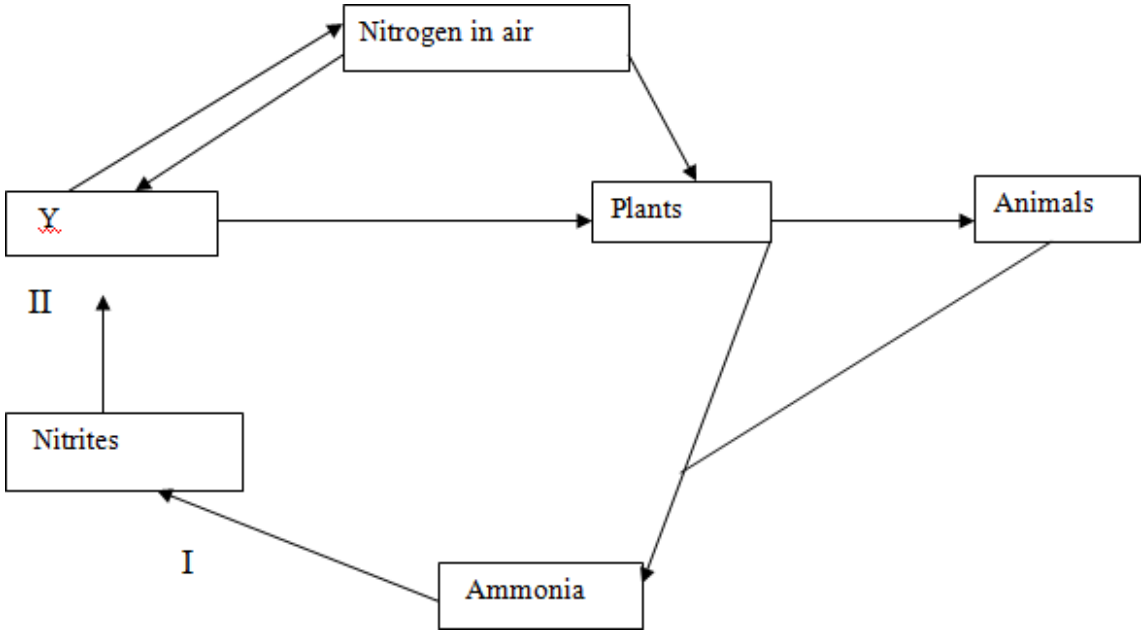
5. a) Define the term carrying capacity (1mk)

b) The food chain below illustrates the flow of energy in a certain habitat Litter Earthworm Frog Snake Name

i) The trophic level that is occupied by litter (1mk)

ii) The organism that has the least biomass (1mk)

c) The diagram below represents the nitrogen cycle



i) Name the compound labeled Y

ii) Name one bacterium that is involved in the process labeled

I. (1mk)

II. ..... (1mk)

d) State one effect of acid rain in a habitat (1mk)

e) Name the causative agent of amoebic dysentery (1mk)

SECTION B (40 Marks)

6. A group of Form one students carried out an experiment to investigate the effects of catalase enzyme concentration on the breakdown of hydrogen peroxide. To measure the rate of reaction, they used a 250cm3 measuring cylinder and recorded how far the foam of bubbles had reached every 10 seconds. They made an enzyme extract by grinding 5g of a liver in a mortar and then diluted it with 15cm3 of distilled water.

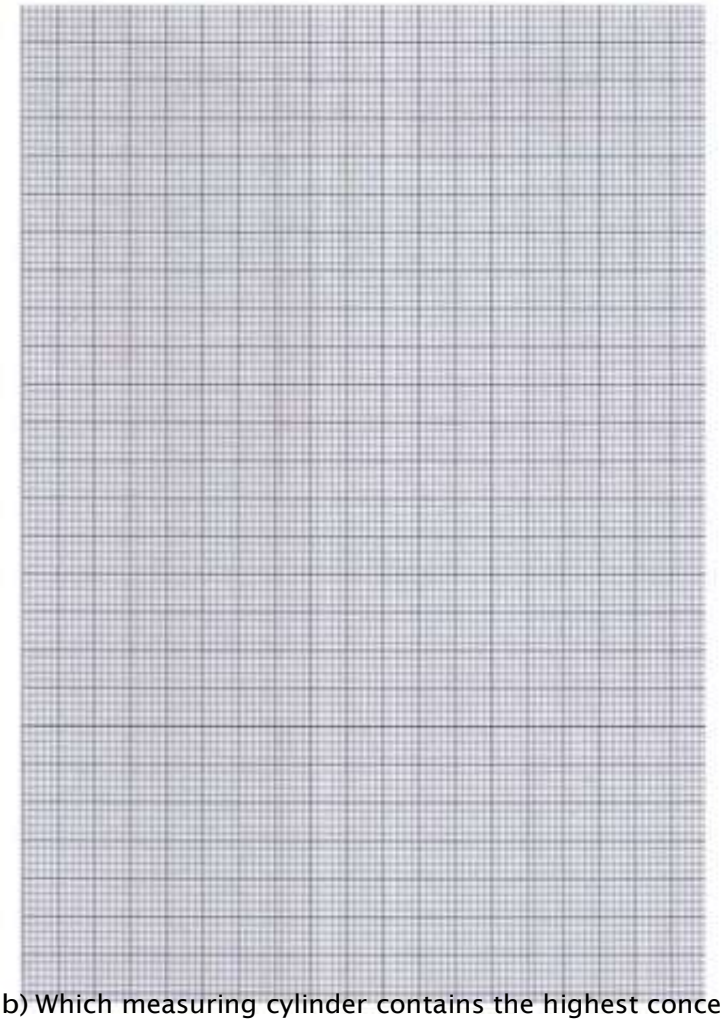
Three measuring cylinders were set up as shown in the table below.

Cylinder	Volume of hydrogen peroxide (cm^3)	Volume of extract (cm^3)	Volume of distilled water (cm^3)
1	5	1	4
2	5	2	3
3	5	3	2

The results of the experiment are shown in the table below.

Time (seconds)	Volume of foam (cm^3)		
	cylinder 1	cylinder 2	cylinder 3
0	10	10	10
10	16	22	30
20	22	36	50
30	28	48	70
40	34	60	88
50	40	74	110
60	46	86	130
70	52	100	152
80	58	114	170
90	64	128	192
100	70	140	210

a) On the same axes, plot graphs of the volume of foam produced in the cylinders against time. (8mks)



b) Which measuring cylinder contains the highest concentration of the enzyme? (1mk)

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c) Why was the liver ground up to make the extract? (1mk)

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d) What was the volume of the foam in cylinder 3 at the 84th second? (1mk)

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e) At what time was the volume of the foam 106cm3 in cylinder 2 (1mk)

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f) Work out the rate of reaction in cylinders numbered 1 and 3 (2mks)

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g) Account for the rate of reaction in the cylinders

1.....
..... (2mks)
3.....
..... (2mks)

h) Other than enzyme concentration, give one factor that would affect this experiment (1mk)
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i) Write an equation for the reaction that occurred in the cylinders. (1mk)

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7. a)

i) The theory of evolution that was suggested by Charles Darwin is referred to as (1mk)

ii) What are the short comings of Larmack's theory. (1mk)

b) Using examples give an account of any four evidences of organic evolution (18mks)

8. a) Describe how a mesophyte leaf is adapted to its function (10mks)

b) How are fruits and seeds adapted to animal dispersal? (10mks)