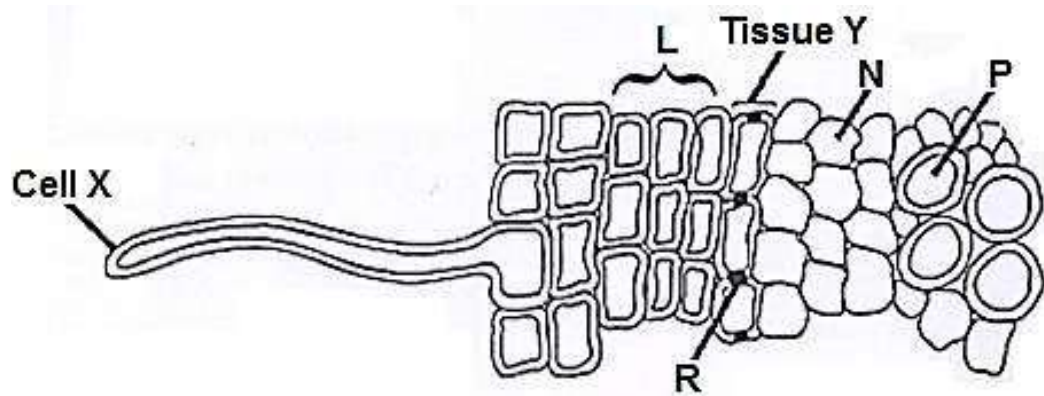


FORM FOUR CLUSTER KCSE MODEL 3
BIOLOGY PAPER 2 QUESTIONS

SECTION A (40 Marks)

1. The diagram shows some cells from a root



a)(i) Name cell X. (1 mark)

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(ii) Using only the information in the diagram, explain how cell X is adapted for its function (3 marks)

.....

b) Name tissue Y. (1 mark)

.....

c) Name each of the structures labeled L and N. (2 marks)

.....

d) Name the process by which mineral salts enter into the plants (1 mark)

.....

2. Dry mass is the mass of all chemicals, excluding water, present in a structure or organism. Some seeds were placed in an incubator at 250C and left to germinate and grow in the dark for 5 days. Table 2.1 shows dry mass in samples of the resulting seedlings.

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Whole seed (g)	225	210	208	206	175	155
Food store (g)	200	183	180	168	129	96
Radicle and plumule (g)	2	4	5	15	23	36

a)(i) Water is needed for germination. State another condition necessary for germination. (1 mark)

.....

(ii) Name the food storage region in a seed. (1 mark)

.....

(iii) Explain why the total mass of the food storage region together with the radicle and plumule is always less than the mass of the whole seedling. (1 mark)

.....

b) Explain the changes in mass over the first five days of

(i) The food storage region. (1 mark)

.....

(ii) The radicle and plumule. (1 mark)

.....

..... **e) If the seedlings were exposed to light from day 2 and day 5, suggest and explain what would happen to the dry masses of**

(i) The food storage region, (1 mark)

.....
.....

ii) Radicle and plumule. (2 marks)

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.....
.....

3.a) What is heterozygous advantage? (1 mark)

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.....
.....

b) Name two disorders in man due gene mutations. (1 mark)

.....
.....

c) State two symptoms of Down's syndrome. (2 marks)

.....
.....

d) In mice, black colour of hair is determined by a dominant gene C albino colour of hair is determined by another dominant allele A. Agouti colour of hair is a wild character which is dependent on both dominant gene A and C being expressed phenotypically.

(i) Find out the phenotypic ratio of F1 offsprings resulting from a cross between agouti and albino mice. (4 marks)

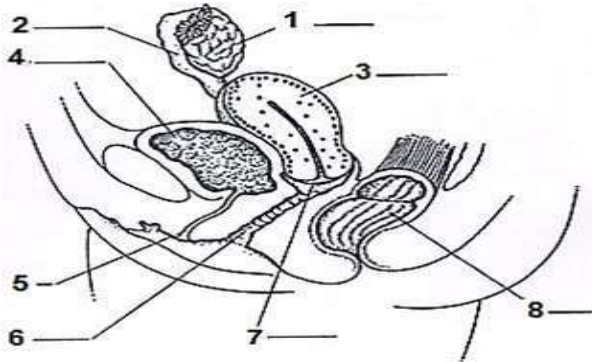
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..... (ii)
Name the type of inheritance pattern illustrated by the cross above. (1 mark)

.....

4.a) The diagram below represents the female urinogenital system.



i. Name the parts labeled 5 and 8. (2 marks)

.....
.....

ii. State the functions of each of the parts labeled 1 and 7 (2 marks)

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.....

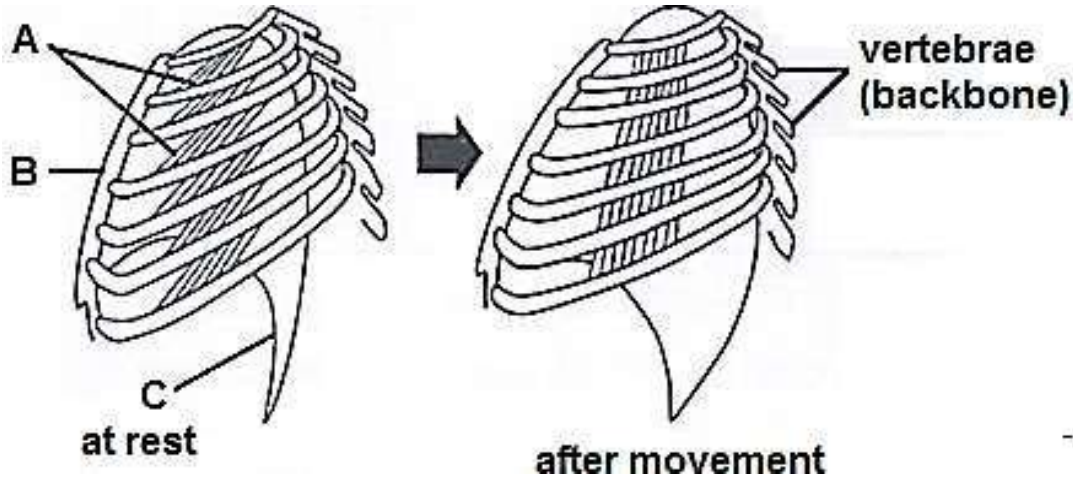
iii. State one way in which each of the parts labeled 2 and 3 are suited to their functions. (2 marks)

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.....

b) Explain the events that occur in the part marked 1 following conception. (2 marks)

.....

5. The figure below shows the movement of the ribs and the diaphragm during breathing.



a) Name each of the parts labeled A, B and C. (3 marks)

.....

b) (i) Name the breathing process shown in the diagram. (1 mark)

.....

(iii) Give a reason for your answer. (1 mark)

.....

c) State what happens to each of the structures labeled A, B and C during the process shown. (3marks)

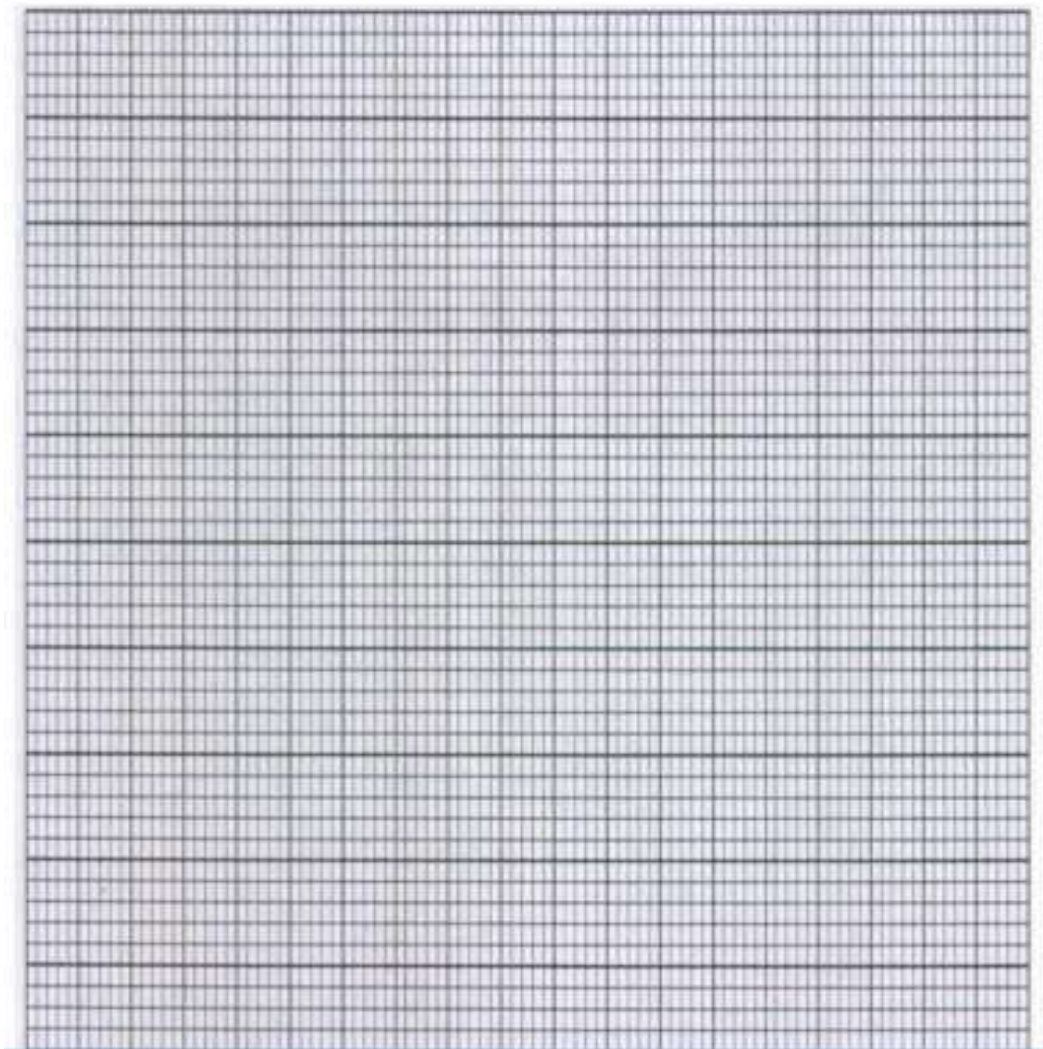
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SECTION B (40 Marks)

6. The table below contains information on changes that occur in a river, downstream from a sewage outflow

Distance downstream from point of sewage entry(m)	Concentration of dissolved oxygen (%)	Number of organisms (arbitrary units)		
		Bacteria	Algae	Fish
0	95	88	20	20
100	30	78	8	6
200	20	74	6	2
300	28	60	20	0
400	42	50	40	0
500	58	48	70	0
600	70	44	84	0
700	80	42	90	0
800	89	38	84	0
900	95	36	68	4
1000	100	34	54	20

a) Plot a graph of number of organisms against distance downstream. (7 marks)



b) Describe the changes in the concentration of oxygen dissolved in the water downstream from the point of sewage entry. (2 marks)

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.....
.....

c) Account for the changes in the numbers of each of the following organisms downstream. i.

Bacteria (3 marks)

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ii. Algae (3 marks)

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.....
.....

iii. Fish (3 marks)

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.....
.....

d) State two ways in which the degree of water pollution caused by sewage can be reduced. (2 marks)

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7. Describe how excretion occurs in the mammalian kidneys.

8. a) Discuss how a normal ear perceives sound. (10mks)

b) Describe the process of accommodation in the human eye. (10 marks)

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