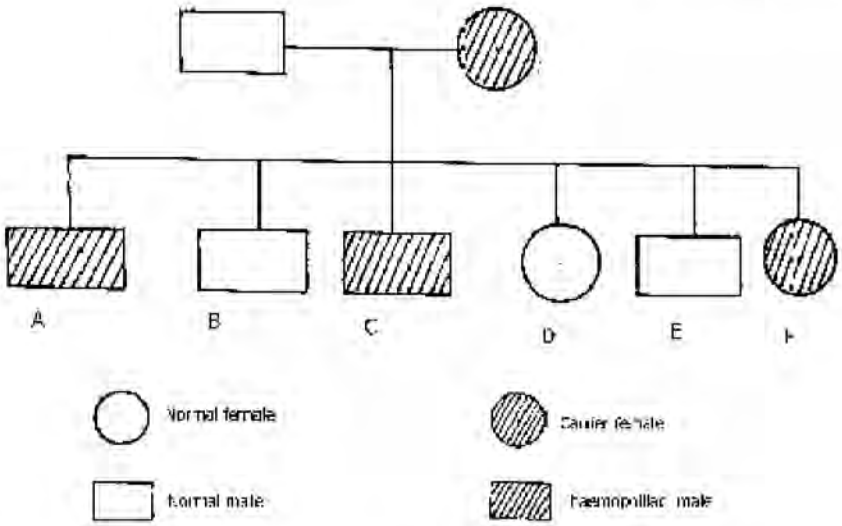
MURANG'A SOUTH MULTILATERAL EXAMINATION 2016
Kenya Certificate of Secondary Education (K.C.S.E)

33/2
BIOLOGY
PAPER 2 (THEORY)
JULY/AUGUST 2016
TIME: 2 HOURS

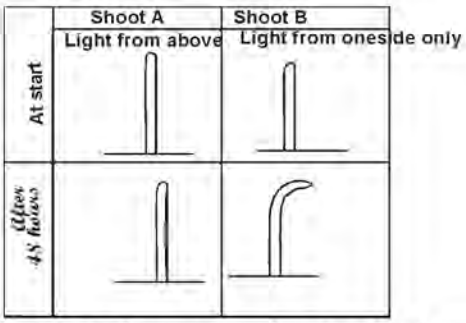
SECTION A (40 marks)
Answer all questions in this section in the spaces provided

1. Study the genetic chart below showing the inheritance of the gene responsible for haemophilia in a family.



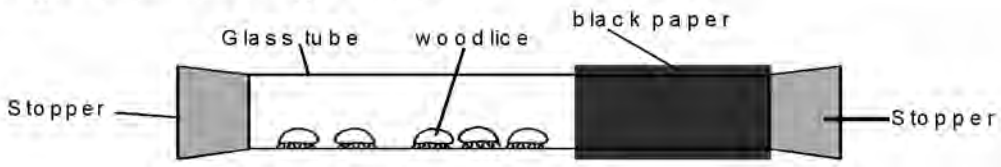
a) Write the genotype of individuals A, B (2mks)
b) A member of this family labeled **F** marries a haemophiliac male. What will be the phenotypic ratio of the offspring? Show your workings (4mks)
c) Other than the condition stated above, state any other **two** common geneticdisorders that result from gene mutation.

2. In an investigation, young plant shoots were exposed to 48hrs of light from above or from one side only. Their growth responses are shown in the diagrams below.



i) Name the response shown by the shoots and explain the advantages of this response to the plants. (2 mark)
ii) Account for the growth response of **shoot B** after 48 hours. (3 mark)

b) An experiment was set up to study the response of woodlice to light. Ten woodlice were placed in a glass tube. After five minutes one end of the tube was covered with black paper to make it dark. The number of woodlice in light and dark was then recorded every minute for five minutes.
The diagram below shows the apparatus used.

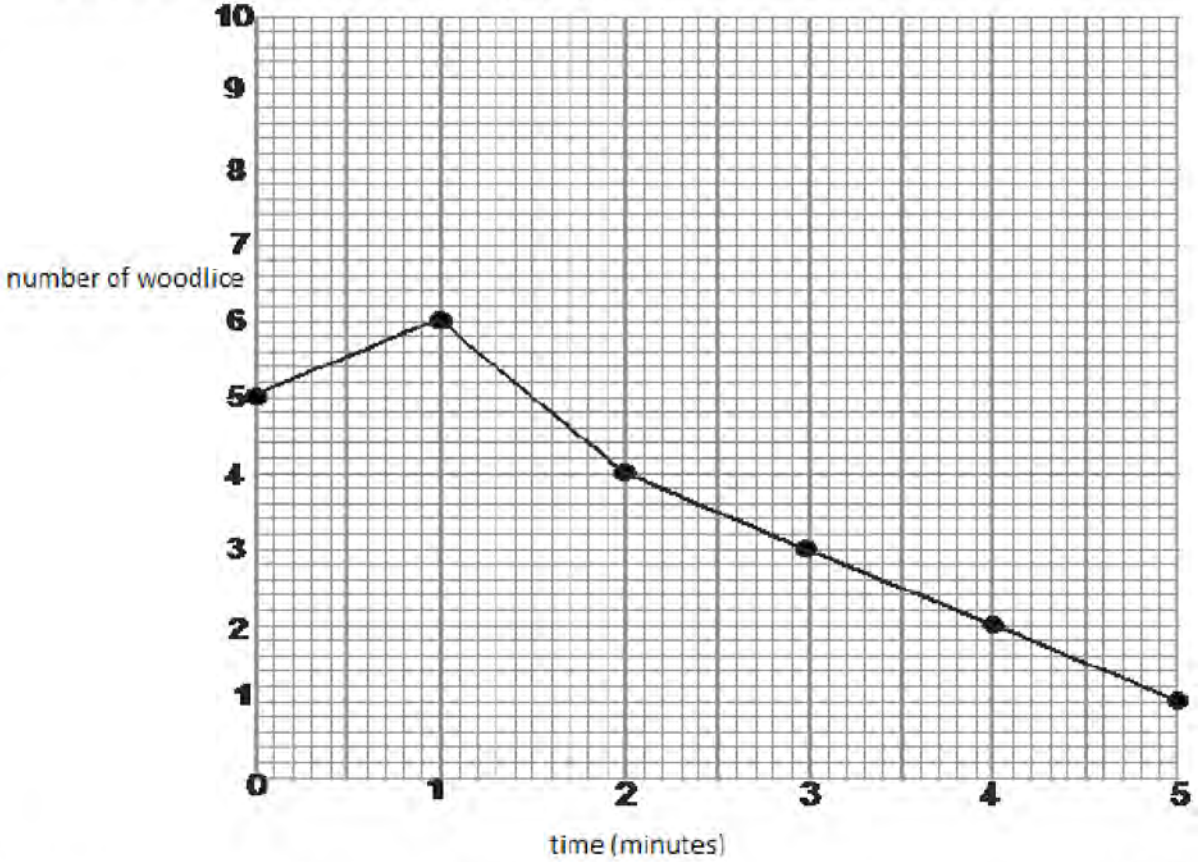


The table below shows the results of the experiment.

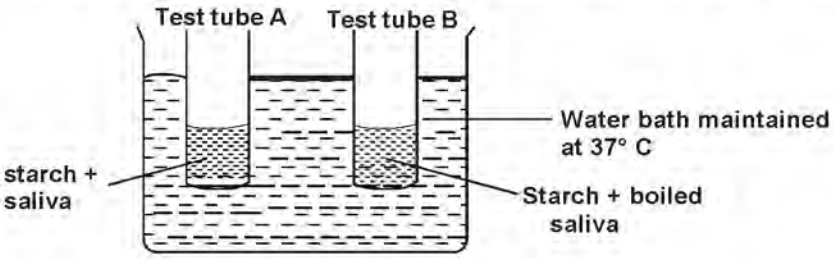
Time (min)		0	1	2	3	4	5
Number of woodlice	In light	5	6	4	3	2	1
	In darkness	5	4	6	7	8	9

i) Why were the woodlice left there for five minutes before the black paper was placed on the tube? (1 mark)

ii) Plot the line graph on the grid below to show the number of woodlice found in the dark at each minute during the experiment. The results for woodlice in light have already been plotted. (2 mark)



3. In an experiment to investigate an aspect of digestion, two test tubes A and B were set up as shown in the diagrambelow.



The test tubes were left in the bath for 30 minutes. The contents of each test tube was then tested for starch using iodine solution.

a) What was the aim of the experiment? (1 mark)
b) What results were expected in test tube A and B. (2 marks)
c) Account for the results you have given in (b) above in test tube A and B. (2 marks)
d) Why was the set up left at 37°C? (1 mark)
e) State two functions of bile juice in digestion. (2 marks)

4. The diagram below represents epidermis of a leaf

a) Name the parts marked E, F and G (3 marks)
b) State **two** aspects of cell E that are an adaptation to its function. (2 marks)
c) Describe the changes that would take place in E if the cells were placed in concentrated sugar solution for a long period. (3 marks)

5. In Europe up to the 19th century, most moth i.e. *Biston betularia* were white speckled. Today upto 97% of the population recorded in the industrial towns in Europe are black. In rural areas most moth found are white speckled form.
i) Briefly explain how this has come about. (5 marks)
ii) Name one cause of variation in nature. (1 mark)
iii) What theory of evolution does it support the description in (i) above support? (1 mark)
iv) In order to increase the quantity and quality of agriculture produce, man selects organisms with desirable characteristics to be parents of next generation. Name the practice.

SECTION B (40MARKS)
Answer questions 6 (COMPULSORY) and Either question 7 or 8

6. Rice seeds were soaked overnight. Fresh mass and dry mass of a sample of 20 seeds was obtained and recorded in the table. The rest of the seeds were planted in a tray that had soil and well watered daily. Twenty of the seeds/seedlings were removed from the soil every two days for two weeks. Their fresh and dry mass were taken and recorded in the table as shown below.

Time in days	Fresh mass in (g)	Dry mass in (g)
0	14.0	4.0
2	18.0	3.5
4	24.5	2.5
6	32.0	1.5
8	38.5	2.0
10	41.0	3.0
12	43.0	4.5
14	45.0	6.0

a) Using the same axes, plot two graphs to represent changes in fresh and dry mass over the two –week period (7mrks)
b) What would be the fresh and dry mass of the seedlings at day 9. (2mrks)
i) Fresh mass
ii) Dry mass
c) Account for the change in fresh mass and dry mass between day 0 and day 6. (4mrks)
i) Fresh mass
ii) Dry mass
d) Explain the change in dry mass from day 8 (2mrks)
e) Explain why a sample of 20 seeds was used instead of one seed. (2mrks)
f) ***State one*** factor within and one factor outside the seed that cause dormancy. (2mrks)
i) Within the seed
ii) Outside the seed
g) ***Give one*** characteristic of a meristematic cell (1mrk)
7. Describe how the mammalian male reproductive system is adapted to perform its functions. (20mks)
8. Describe the role of hormones in the growth and development of plants (20 marks)