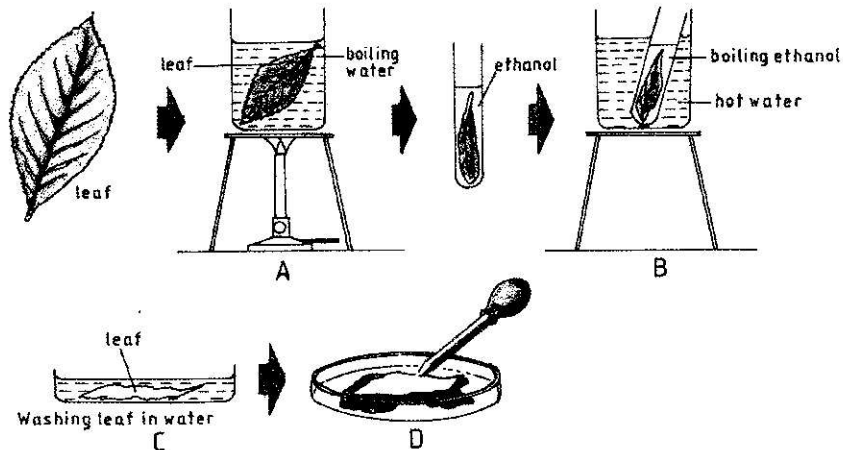


2.1.2 Biology Paper 2 (231/2)

SECTION A (40 marks)

Answer *all* the questions in this section in the spaces provided.

- 1 The set-up below illustrates a procedure that was carried out in the laboratory with a leaf plucked from a green plant that had been growing in sunlight.



- (i) What was the purpose of the above procedure? (1 mark)

.....

- (ii) Give reasons for carrying out steps A, B and C in this procedure. (3 marks)

A.....

.....

B.....

.....

C.....

.....

- (iii) Name the reagent that was used at the step labelled D. (1 mark)

.....

.....

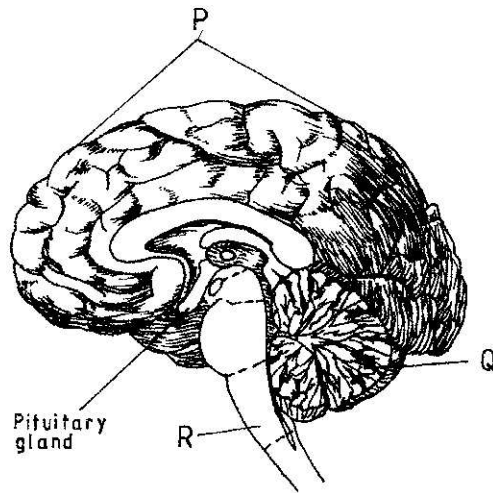
- (iv) State the expected result on the leaf after adding the reagent named in (iii) above. (1 mark)

.....

- 2 In humans, hairy ears is controlled by a gene on the Y Chromosome.
- (a) Using letter Y^H to represent the chromosome carrying the gene for hairy ears, work out a cross between a hairy eared man and his wife. (4 marks)
- (b) (i) What is the probability of the girls having hairy ears? (1 mark)
- (ii) Give a reason for your answer in (b(i) above. (1 mark)
- (c) Name **two** disorders in humans that are determined by sex-linked genes. (2 marks)
- (d) Explain how comparative embryology is an evidence for organic evolution. (2 marks)
3. (a) Name the causative agents for the following respiratory diseases. (2 marks)
- (i) Whooping cough.

- (ii) Pneumonia.

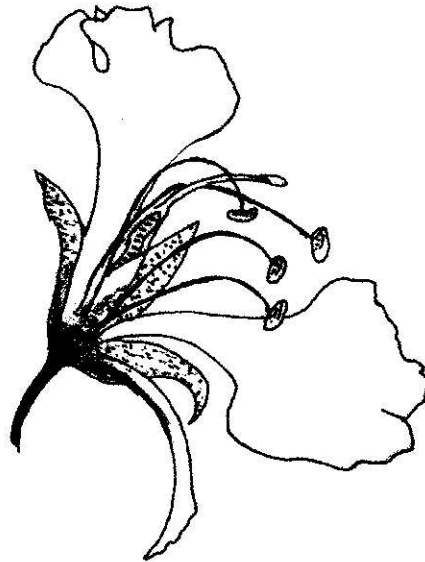
- (b) Describe how oxygen in the alveolus reaches the red blood cells. (4 marks)
- (c) How are the pneumatophores adapted to their function? (2 marks)
- 4 (a) The diagram below represents a section of the human brain.



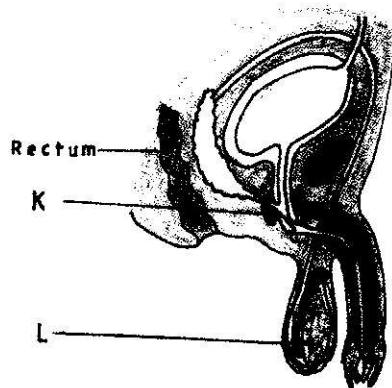
- (i) Name the structures labelled P and R. (2 marks)
- P
- R
- (ii) State **two** functions of the part labelled Q. (2 marks)

- (b) (i) Name **two** reproductive hormones secreted by the pituitary gland in women. (2 marks)
- (ii) State **one** function of each of the hormones named in (b)(i) above. (2 marks)

5 (a) The diagram below represents a flower.



- (i) On the diagram, name **two** structures where meiosis occurs. (2 marks)
- (ii) How is the flower adapted to prevent self-pollination? (2 marks)
- (ii) How is the flower adapted to prevent self-pollination? (2 marks)
- (b) The diagram below represents a human reproductive organ.



- (i) Explain **two** adaptations of the structure labelled **L** to its functions. (2 marks)
- (ii) Explain the role of the gland labelled **K**. (2 marks)

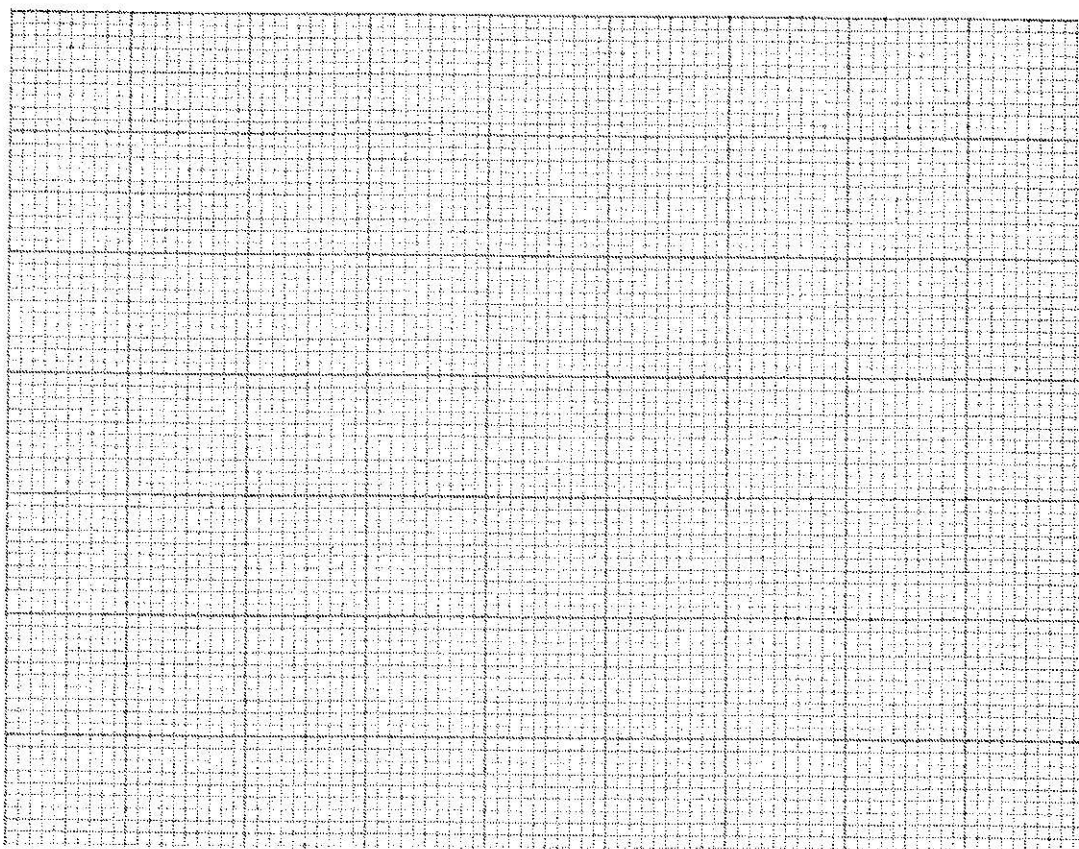
SECTION B (40 marks)

Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

- 6 (a) An experiment was carried out to investigate the population of a certain micro-organism. Two petri-dishes were used. Into the petri-dish labelled M, 60cm^3 of a culture medium was placed while 30cm^3 of the same culture medium was placed in petri-dish labelled N. Equal numbers of the micro-organisms were introduced in both petri-dishes. The set-ups were then incubated at 35°C . The number of micro-organisms in each petri-dish was determined at irregular intervals for a period of 60 hours. The results were as shown in the table below.

Relative number of micro-organisms	M	40	40	180	280	1200	1720	1600	1840	1560	600
	N	40	40	120	200	680	560	560	600	600	400
Time in hours		0	5	10	15	23	30	35	42	45	60

- (i) On the same axes, draw the graphs of relative number of micro-organisms against time on the grid provided. (7 marks)



- (ii) After how many hours was the difference between the two populations greatest? (1 mark)

- (iii) Work out the difference between the two populations at 50 hours. (2 marks)
- (iv) With a reason state the effect on the population of micro-organisms in petri-dish M if the temperature was raised to 60°C after 20 hours. (2 marks)
- (v) Account for the shape of the curve for population in petri-dish N between 46 hours and 59 hours. (3 marks)
- (b) Explain how the osmotic pressure in the human blood is maintained at normal level. (5 marks)
- 7** (a) Explain how structural features in terrestrial plants affect their rate of transpiration. (13 marks)
- (b) Explain how the human skin brings about cooling of the body on a hot day. (7 marks)
- 8** (a) Describe the exoskeleton and its functions in insects. (13 marks)
- (b) Describe how accommodation in the human eye is brought about when focusing on a near object. (7 marks)