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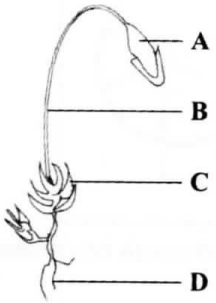
4.3.2 Biology Paper 2 (231/2)

SECTION A (40 marks)

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

1 (a) The diagram below represents a plant in the division Bryophyta.



(i) Name the parts labelled **B** and **D**. (2 marks)

B .....

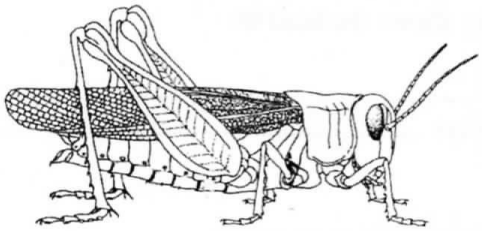
D .....

(ii) State **one** function for each of the parts labelled **A** and **C**. (2 marks)

A .....

C .....

(b) The diagram below represents a member of the kingdom Animalia.



(i) Name the phylum to which the organism belongs. (1 mark)

(ii) Using observable features in the diagram, give **three** reasons for the answer in b(i). (3 marks)

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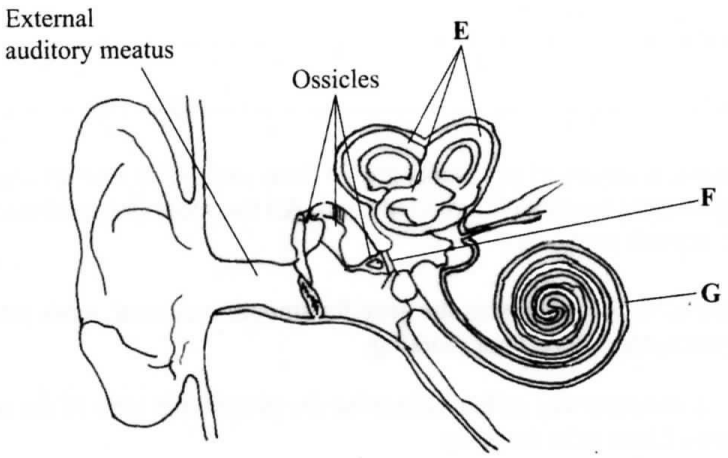
2 The diagram below represents the human ear.



(a) Name the parts labelled **E**, **F** and **G**. (3 marks)

E .....

F.....

G.....

(b) How is each of the following adapted to its function?

(i) External auditory meatus; (2 marks)

(ii) Ear ossicles. (2 marks)

(c) Name **one** defect of the human ear. (1 mark)

3 (a) Explain the importance of the following in photosynthesis: (3 marks)

(i) light;

(ii) carbon(IV) oxide;

(iii) chlorophyll.

(b) Name **one** appropriate food substance for each of the following enzymes: (2 marks)

(i) ptyalin .....

(ii) pepsin .....

(c) State the cause and **two** symptoms of Beri-beri.

Cause ..... (1 mark)

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Symptoms (2 marks)

(i) .....

(ii) .....

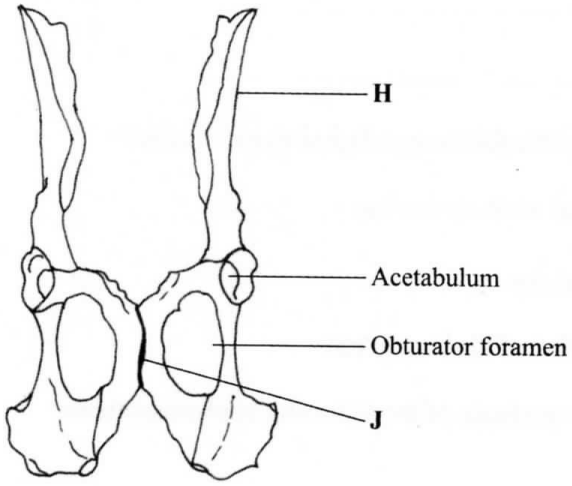
4 In an investigation, a variety of pea plants grown from seeds with smooth coats were crossed with plants grown from seeds with wrinkled coats. All the seeds obtained in the first filial (F_1) generation had smooth seed coats.

(a) Using the letter R to represent the gene for smooth seed coat, work out the genotype of the F_1 generation. Show your working. (3 marks)

(b) If the F_1 generation was selfed, determine the phenotypic ratio of the second filial (F_2) generation. Show your working. (3 marks)

(c) If the total number of seeds in the F_2 generation was 14 640, calculate the number of seeds with wrinkled coats. Show your working. (2 marks)

5 The diagram below represents a mammalian pelvic girdle.



(a) How are the structures labelled **H** and **J** adapted to their function?

(i) **H** (2 marks)

(ii) **J** (2 marks)

(b) State the function of obturator foramen. (1 mark)

(c) (i) Name the bone that articulates with the pelvic girdle at acetabulum. (1 mark)

(ii) Name the type of joint formed by the acetabulum and the bone named in (c)(i) above. (1 mark)

(d) Name the bone formed by the fusion of caudal vertebrae in human beings. (1 mark)

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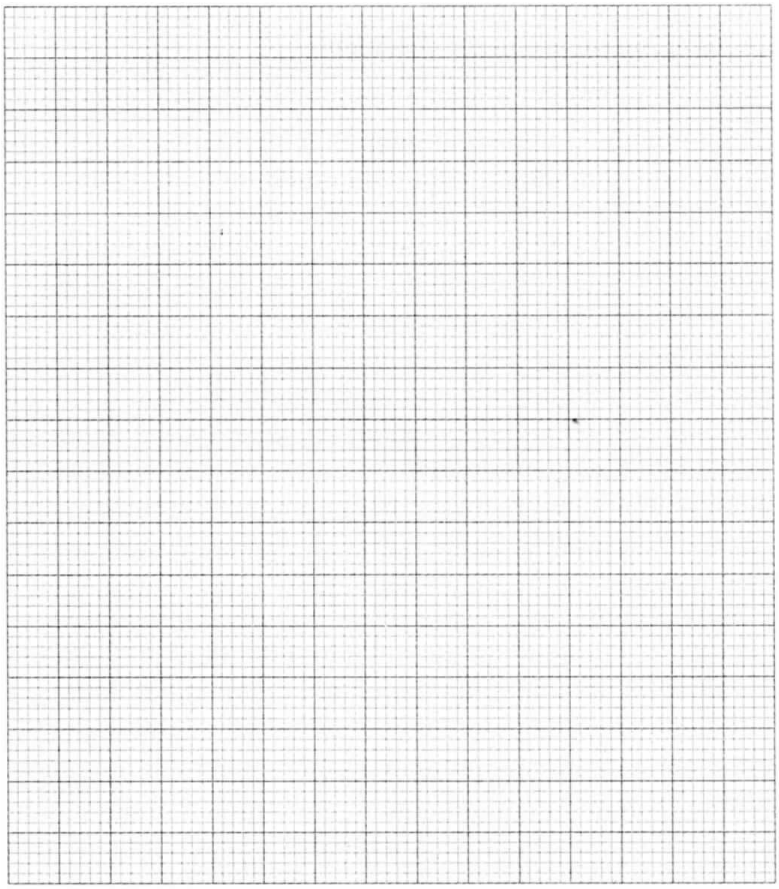
SECTION B (40 marks)

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

6 A scientist carried out an investigation to find out the population growth of mice under laboratory conditions. Twenty young mice were placed in a cage. The results obtained from the investigation were as shown in the table below.

Time in months	0	2	4	6	7	10	12	16	18
Number of mice	20	20	65	115	310	455	450	145	160

(a) On the grid provided, draw a graph of the number of mice against time. (6 marks)



(b) Account for the changes in mice population between

(i) 0 to 2 months (2 marks)

(ii) 2 to 6 months (2 marks)

(iii) 6 to 10 months (2 marks)

(iv) 10 to 12 months. (2 marks)

(c) (i) Between which two months was the population change greatest? (1 mark)

(ii) Calculate the rate of population change over the period in (c)(i) above. (2 marks)

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(d) What change in population would be expected if the investigation was continued to the 19th month? (1 mark)

(e) To obtain the observed results state **two** variables that were kept constant during the investigation. (2 marks)

7 (a) Describe the process of blood clotting in human beings. (10 marks)

(b) How are respiratory surfaces in mammals adapted to their functions? (10 marks)

8 Describe the role of the following organs in excretion and homeostasis.

(a) the liver (10 marks)

(b) the skin during hot environmental conditions. (10 marks)

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