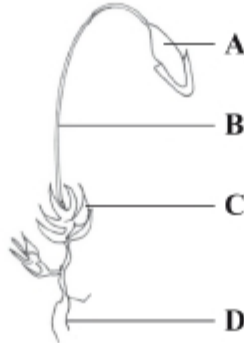


3.4.2 Biology Paper 2 (231/2)

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

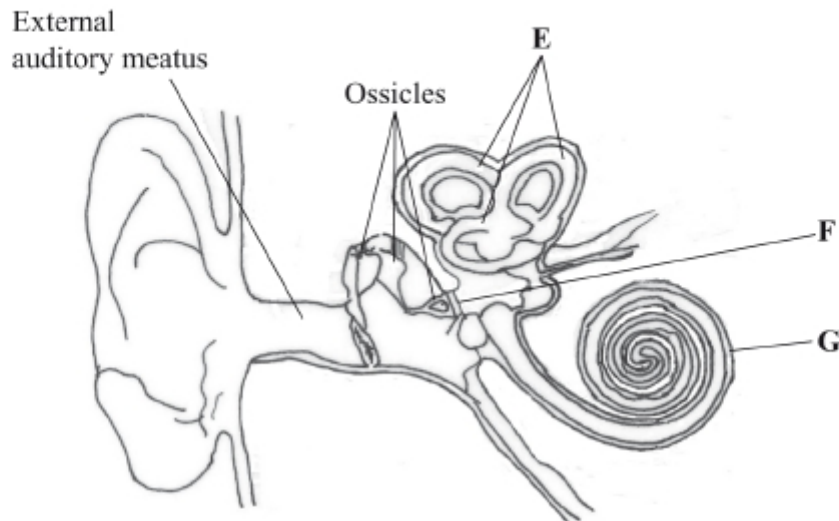
- (b) The diagram below represents a member of the kingdom Animalia.



- (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)

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.

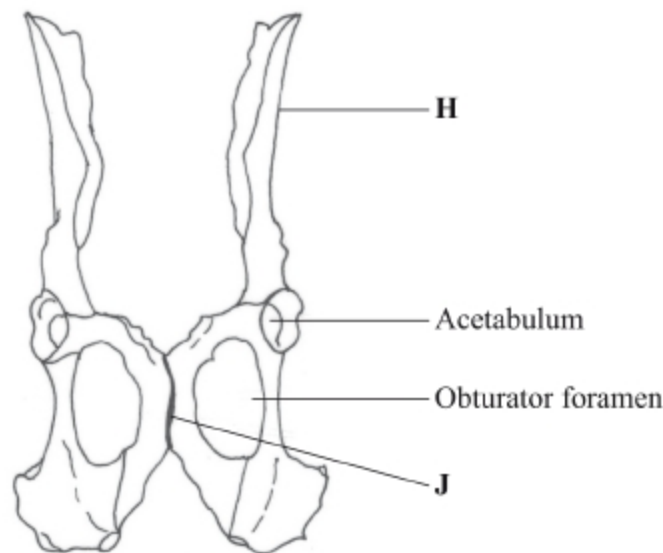
Cause (1 mark)

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)

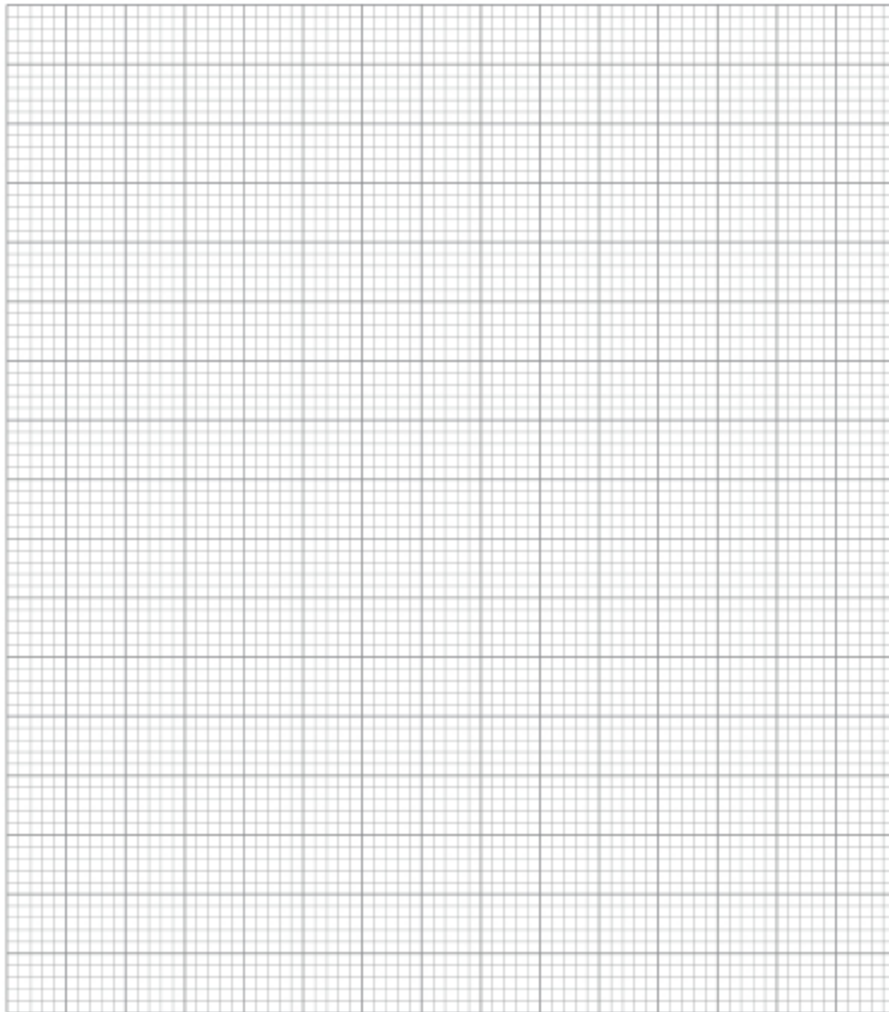
SECTION B (40 marks)

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)

- (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)