16.1 Passage of Information from Parents to Offspring

Question Paper

Course	CIE A Level Biology
Section	16. Inheritance
Topic	16.1 Passage of Information from Parents to Offspring
Difficulty	Medium

Time allowed: 50

Score: /37

Percentage: /100

Question 1a

Fig. 1 shows the life cycle of a fern plant.

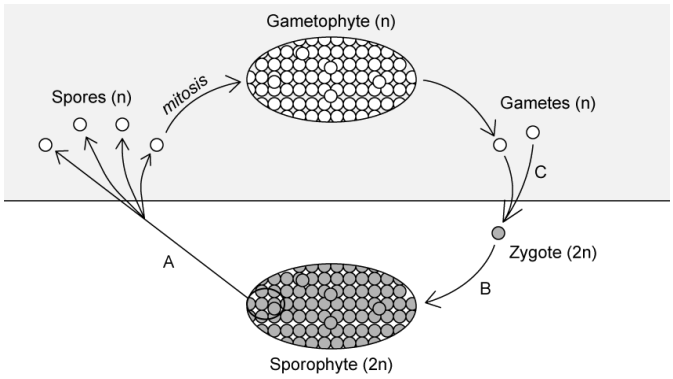

Fig. 1

Explain what is indicated by the term *n* in Fig.1

[2 marks]

Question 1b

Name the processes taking place at the stages marked **A** and **B** in Fig. 1

[2 marks]

Question 1c

Describe the events at stage **C** in Fig. 1

[1 mark]

Question 1d

Explain the importance of the process taking place at the point marked **A** in Fig. 1

[3 marks]

Question 2a

Fig. 1 shows microscope images of cells undergoing meiosis.

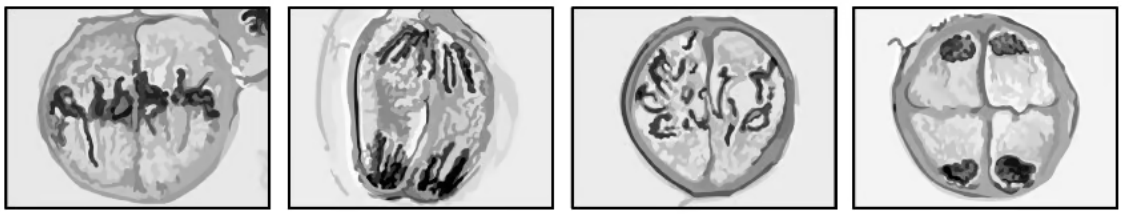

Fig. 1

Identify the stages of meiosis shown in Fig. 1

[4 marks]

Question 2b

Fig. 2 shows a pair of chromosomes during meiosis in a *Drosophila melanogaster* (fruit fly) testis cell. The position of the alleles of some genes is indicated.

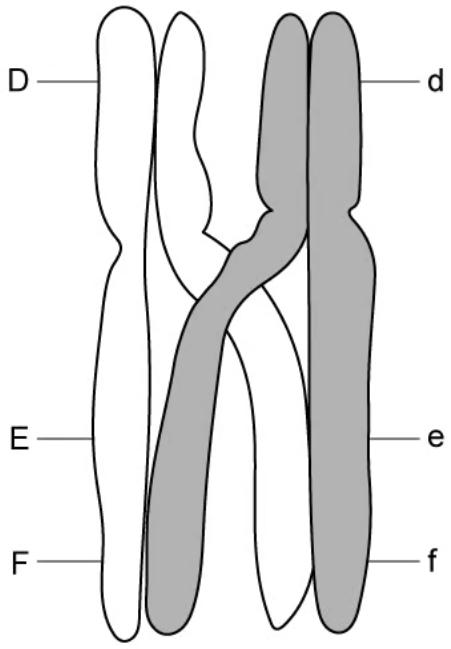

Fig. 2

Describe the process shown in Fig. 2

[2 marks]

Question 2c

Fig. 3 shows the *D. melanogaster* gametes containing the chromosomes shown in Fig. 2 at the end of meiosis.

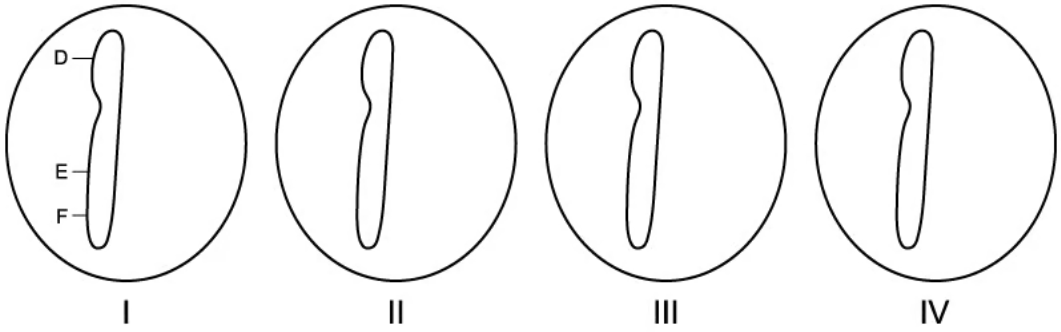

Fig. 3

Complete diagrams **II**-**IV** to show the allele combinations for the remaining chromosomes.

[3 marks]

Question 2d

The process shown in Fig. 2 contributes to genetic variation in *D. melanogaster*.

Explain why genetic variation is important for the survival of *D. melanogaster* as a species.

[2 marks]

Question 3a

Fig.1 shows a cell undergoing cell division.

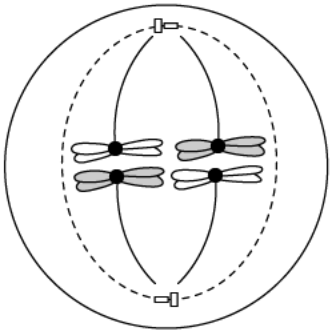

Fig. 1

(i)
Identify the type of cell division taking place in Fig. 1.

[1]

(ii)
Describe the events taking place in Fig. 1.

[2]

[3 marks]

Question 3b

Explain how the process shown in Fig. 1 contributes to genetic variation.

[2 marks]

Question 3c

The number of possible chromosome combinations that can be generated during the stage of cell division shown in Fig.1 can be calculated using the equation:

$$2^n$$

Where n is the number of pairs of chromosomes present in the cell.

Calculate the number of possible chromosome combinations that could be generated by the cell shown in Fig.1.

[2 marks]

Question 3d

Fig. 2 shows a cell from the same organism in a different stage of cell division.

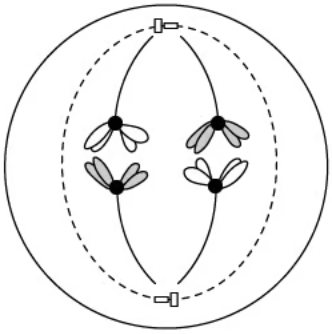

Fig. 2

(i)
Identify the precise stage of cell division shown in Fig. 2.

[1]

(ii)
Give reasons for your answer to part i).

[2]

[3 marks]

Question 4

Describe the behaviour of chromosomes during meiosis.

[8 marks]