**1.** Which response describes the behaviour of chromosomes in metaphase I and anaphase II of meiosis?

|  |  |  |
| --- | --- | --- |
|  | **Metaphase I** | **Anaphase II** |
| A. | Chromosomes line up at the equator | Separation of homologous chromosomes |
| B. | Tetrads (bivalents) line up at the equator | Separation of homologous chromosomes |
| C. | Chromosomes line up at the equator | Separation of sister chromatids |
| D. | Tetrads (bivalents) line up at the equator | Separation of sister chromatids |

(Total 1 mark)

**2.** A cell with a diploid number of 12 chromosomes undergoes meiosis. What will be the product at the end of meiosis?

A. 2 cells each with 12 chromosomes

B. 4 cells each with 6 chromosomes

C. 2 cells each with 6 chromosomes

D. 4 cells each with 12 chromosomes

(Total 1 mark)

**3.** What are homologous chromosomes?

A. Two chromosomes with differing sets of genes, in the same sequence, with the same alleles

B. Two chromosomes with the same set of genes, in a different sequence, with the same alleles

C. Two chromosomes with a different set of genes, in the same sequence, with different alleles

D. Two chromosomes with the same set of genes, in the same sequence, sometimes with different alleles

(Total 1 mark)

**4.** The diagram below shows a cell undergoing meiosis. What is this stage of meiosis?



A. Anaphase I

B. Prophase I

C. Anaphase II

D. Telophase II

(Total 1 mark)

**5.** What is the usual cause of Down’s syndrome?

A. 21 pairs of chromosomes

B. Trisomy 21

C. Non-disjunction of sex chromosomes

D. Fertilization of the egg by two sperm

(Total 1 mark)

**6.** (a) State the names of the parts of the chromosome labelled (i) and (ii) on the diagram below.



(2)

[Source: adapted from Hartwell (editor) (2003), *Genetics: from Genes to Genomes,* 2nd edition, McGraw Hill, page 81]

(b) Explain how the inheritance of chromosome 21 can lead to Down’s syndrome.

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(3)

(c) Explain how meiosis promotes variation in a species.

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(2)

(Total 7 marks)

**7.** Explain how meiosis and fertilization can give rise to genetic variety.

(Total 6 marks)

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**8.** Outline the differences between the behaviour of the chromosomes in mitosis and meiosis.

(Total 5 marks)

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