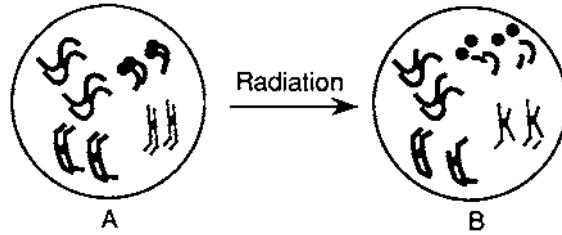


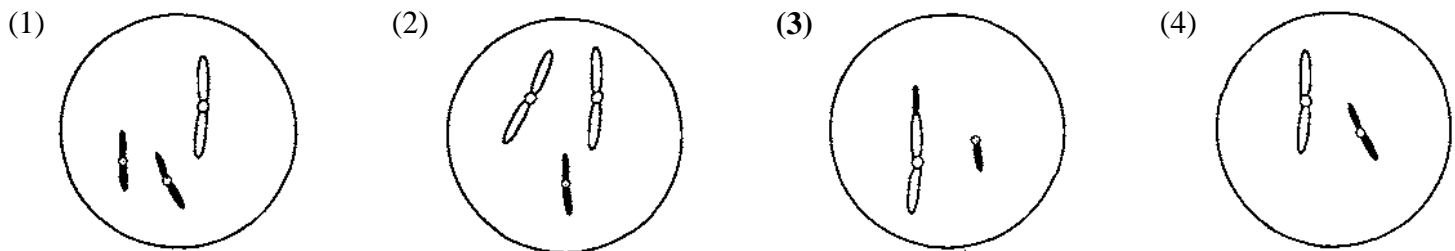
1. The diagram below represents the four pairs of homologous chromosomes in a cell of a fruit fly before exposure to radiation (A) and after exposure to radiation (B).



The appearance of the chromosomes in B indicates that exposure to radiation has caused

- (1) crossing-over
 (2) **chromosomal alterations**
 (3) segregation and recombination
 (4) nondisjunction

2. A cell undergoing synapsis during meiosis is represented above. Which diagram below best represents a gamete that formed from this cell and that contains a mutation caused by chromosome breakage and reattachment?



3. Sometimes a section of a chromosome is lost during meiosis. This loss results in a change in genetic material known as

- (1) **a deletion** (2) replication (3) crossing-over (4) polyploidy

4. Which statement best describes chromosomal mutations?

- (1) They only involve changes in the chromosome number.
 (2) They only involve changes in the chromosome structure.
 (3) **They involve changes in the chromosome number or the chromosome structure.**
 (4) They never involve changes in the chromosome number or the chromosome structure.

5. An analysis of chromosomes may show the loss of a portion of a chromosome. This type of chromosomal change is known as

- (1) nondisjunction (2) an addition (3) translocation (4) **a deletion**

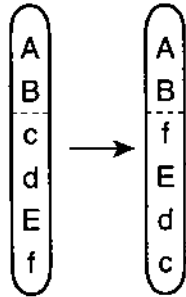
6. The failure of homologous chromosomes to separate from each other is known as

- (1) crossing-over (2) disjunction (3) **nondisjunction** (4) synapsis

7. In certain plants, each cell contains double the normal chromosome number. These $4n$ cells are an example of the condition known as

- (1) replication (2) diploidy (3) **polyploidy** (4) disjunction

8. The diagram below illustrates the results of random breakage and recombination of genetic material.



The process illustrated in the diagram is an example of

- (1) a single gene mutation (3) synapsis
(2) **a chromosomal alteration** (4) segregation

9. Which change involves the loss of part of a chromosome?

- (1) **deletion** (2) addition (3) base substitution (4) gene mutation

10. Which change in chromosome structure involves the transfer of one section of a chromosome to a nonhomologous chromosome?

- (1) nitrogenous base substitution (3) crossing-over of linked genes
(2) **translocation** (4) gene mutation

11. Which illustration of a chromosomal change best represents a chromosome mutation known as a deletion?

- (1) **ABCDEF** → **ABCDEF** (3) **ABCDEF** → **ABEDCFG**
(2) **ABCDEF** → **ABCDEFH** (4) **ABCDEF** → **ABCDEFKMN**

12. A chromosomal alteration in which one or more pairs of homologous chromosomes fail to separate normally during meiotic cell division is known as

- (1) an addition (2) crossing-over (3) **nondisjunction** (4) translocation

13. Which statement best describes a chromosomal alteration?

- (1) It never affects the phenotype of an organism.
(2) **It may affect the phenotype of an organism.**
(3) It always produces a recessive genotype in an organism.
(4) It never has an effect on the genotype of an organism.

14. In a species of plant, the sudden appearance of one plant with a different leaf structure would most likely be the result of

- (1) stable gene frequencies (3) slow environmental changes
(2) **chromosomal mutations** (4) asexual reproduction