Mitosis, Meiosis, and the Cell Cycle

Choose one answer per question. Circle A, B, C, or D.

1. Which process supplies new nuclei with the same chromosome sets when animal tissue grows?
   A. Mitosis
   B. Meiosis I
   C. Fertilization
   D. Crossing over

2. Which type of nuclear division reduces the number of chromosome sets when an animal forms reproductive cells?
   A. DNA replication
   B. Mitosis
   C. Meiosis
   D. Binary fission

3. During which phase of the cell cycle does a typical cell copy its chromosomal DNA before mitosis?
   A. G1 phase
   B. S phase
   C. Metaphase
   D. Telophase

4. An animal cell has formed two new nuclei. The membrane then pinches inward and separates the cell into two. What is the separation step called?
   A. Metaphase
   B. Chromosome replication
   C. Synapsis
   D. Cytokinesis

5. After a chromosome is replicated, what are the two joined copies of that chromosome called?
   A. Homologous chromosomes
   B. Sister chromatids
   C. Spindle poles
   D. Chromosome sets

6. A cell undergoing mitosis has condensed chromosomes arranged individually across its middle. Sister chromatids are still joined. Which stage fits this image?

A. Metaphase
B. Anaphase
C. Telophase
D. G1 phase

7. A teacher pauses a mitosis animation just as sister chromatids begin moving toward opposite poles. Which stage is shown?

A. Telophase
B. Prophase
C. Metaphase
D. Anaphase

8. Two maternal and paternal copies of a chromosome are paired before the first meiotic division. What separates at anaphase I?

A. The two strands of each DNA molecule
B. The sisters within each chromosome
C. The homologous chromosomes
D. The ends of each chromosome

9. Which two DNA copies can exchange corresponding segments during ordinary crossing over in prophase I?

A. Nonsister chromatids in a homologous pair
B. The two DNA strands within a single chromatid
C. Chromatids from unrelated chromosome pairs
D. The centromere and the spindle fiber

10. What event makes anaphase II of meiosis resemble anaphase of mitosis?

A. A diploid nucleus becomes haploid as homologs separate
B. Homologous chromosomes pair
C. Chromosomes undergo DNA replication
D. Sister chromatids separate

11. A diploid cell has eight chromosomes before S phase. After ordinary mitosis and cytokinesis, how many chromosomes does each daughter nucleus have?

A. Sixteen
B. Four
C. Eight
D. Two

12. A diploid starting cell has six chromosomes. After normal meiosis I, what is present in each new nucleus?

A. Six chromosomes, each still made of two sister chromatids
B. Three chromosomes, each still made of two sister chromatids
C. Three chromosomes each made of a single chromatid
D. Six chromosomes each made of a single chromatid

13. A cell has just completed meiosis I. Which event normally happens before it completes meiosis II?

A. It pairs maternal and paternal homologs again
B. It goes through another S phase before homologs separate
C. It returns to a diploid state by fusing with the other daughter cell
D. It separates its sister chromatids without copying all its DNA again

14. Which event explains why different meiotic divisions can distribute different combinations of whole maternal and paternal homologs, even if there is no crossing over?

A. Homologous pairs orient independently in meiosis I
B. Every maternal homolog goes to the same pole
C. Sister chromatids undergo an extra round of DNA replication
D. All homologs fuse into one chromosome before division

15. Starting with one normal diploid cell, which comparison describes the usual outcomes after one round of mitosis or after both meiotic divisions?

A. Both form two diploid nuclei
B. Mitosis forms four haploid nuclei, while meiosis forms two diploid nuclei
C. Mitosis forms two diploid nuclei, while meiosis forms four haploid nuclei
D. Both form four diploid nuclei