

10. A group of cells is assayed for DNA content immediately following mitosis and is found to have an average of 8 picograms [10^{-12} of a gram] of DNA per nucleus. Those cells would have _____ pictograms at the end of the S phase and _____ pictograms at the end of G_2 .

- A. 8; 8
- B. 8; 16
- C. 16; 8
- ☒ D. 16; 16
- E. 8; 4

11. A nucleus has 11 chromosomes. What is the only valid conclusion from this observation?

- A. The cell is diploid.
- ☒ B. The cell is haploid.
- C. The cell is in G_0 .
- D. Each chromosome has only one chromatid.
- E. The cell is able to undergo meiosis.

12. In meiosis at what stage are tetrads of chromosomes aligned at the centre of the cell and independent assortment soon follows.

- A. Prophase I
- ☒ B. Metaphase I
- C. Interphase
- D. Metaphase II
- E. Telophase II

13. During which phase(s) of mitosis do we find chromosomes composed of two chromatids?

- A. from interphase through anaphase
- B. from G_1 of interphase through metaphase
- C. from metaphase through telophase
- D. from anaphase through telophase
- ☒ E. from G_2 of interphase through metaphase

14. In meiosis synapsis of homologous chromosome pairs occurs and crossing over may follow.

- A. Prophase I
- B. Metaphase I
- ☒ C. Interphase
- D. Prophase II
- E. Metaphase II

15. In meiosis centromeres of sister chromatids uncouple and chromatids separate at which phase?

- A. Metaphase I
- B. Anaphase I
- C. Prophase II
- ☒ D. Anaphase II
- E. Metaphase II

16. A cross between homozygous purple-flowered and homozygous white-flowered pea plants results in offspring with purple flowers. This demonstrates

- A. the blending model of genetics.
- ☒ B. true-breeding.
- ☒ C. dominance.
- D. a dihybrid cross.
- E. linkage which was unknown to Mendel.

17. In a cross **AaBbCc** x **AaBbCc**, what is the probability of producing the genotype **AABBCC**?

- A. $1/4$
- B. $1/8$
- C. $1/16$
- D. $1/32$
- ☒ E. $1/64$

18. Alleles

- A. are the result of hybridization.
- B. are present only in the F_1 generation.
- C. occur in a 3 : 1 ratio.
- ☒ D. are alternate forms of a gene.
- E. don't affect the phenotypes until the F_2 generation.

19. In a cell in which $2n=6$, the independent assortment of chromosomes during meiosis can by itself give rise to _____ genetically different gametes.

- A. 1
- B. 4
- C. 5
- D. 8
- ☒ E. 12