

- 1) Which of the following organisms does NOT reproduce cells by mitosis and cytokinesis?
 - A) cow
 - B) bacterium
 - C) mushroom
 - D) cockroach
 - E) banana tree
- 2) When does chromosome replication occur in a eukaryotic cell?
 - A) prophase
 - B) metaphase
 - C) anaphase
 - D) interphase
 - E) telophase
- 3) The longest period of a cell's life cycle is
 - A) prophase.
 - B) telophase.
 - C) interphase.
 - D) anaphase.
 - E) metaphase.
- 4) Diploid cells of the fruit fly *Drosophila* have 10 chromosomes. How many chromosomes does a *Drosophila* gamete have?
 - A) one
 - B) two
 - C) five
 - D) ten
 - E) twenty
- 5) Human body cell nuclei contain
 - A) 46 pairs of chromosomes.
 - B) 44 pairs of chromosomes.
 - C) 23 unpaired chromosomes.
 - D) 22 pairs of chromosomes.
 - E) 23 pairs of chromosomes.
- 6) Cell reproduction in prokaryotic cells differs from eukaryotic cells in that
 - A) prokaryotic cells reproduce asexually but eukaryotic cells do not.
 - B) each prokaryotic cell has a circular chromosome but the chromosomes of eukaryotic cells are linear.
 - C) prokaryotic cells lack nuclei and do not replicate their DNA before dividing but eukaryotic cells have nuclei and replicate their DNA before dividing.
 - D) prokaryotic chromosomes have DNA and protein but eukaryotic chromosomes are made of only DNA.
 - E) They do not differ significantly in any way.
- 7) A cell is cleaved into two approximately equal halves, each with about the same amount of cytoplasm, during
 - A) interphase.
 - B) cytophase.
 - C) cytokinesis.
 - D) spindle apparatus formation.
 - E) none of the above
- 8) During mitotic anaphase, chromatids migrate
 - A) from the poles of the cell toward the metaphase plate.
 - B) from the metaphase plate toward the poles.
 - C) toward the nuclear envelope.
 - D) along with their sister chromatids toward one pole.
 - E) along with the other member of the homologous pair toward the metaphase plate.
- 9) The formation of a cell plate is beginning across the middle of a cell and nuclei are reforming at opposite ends of a cell. What kind of a cell is this?
 - A) an animal cell in metaphase
 - B) an animal cell in telophase
 - C) an animal cell undergoing cytokinesis
 - D) a plant cell in metaphase
 - E) a plant cell undergoing cytokinesis
- 10) Mitosis in humans usually results in the formation of
 - A) 2 diploid cells.
 - B) 4 diploid cells.
 - C) 2 haploid cells.
 - D) 4 haploid cells.
 - E) sperm or egg cells.
- 11) During which stage of mitosis do chromosomes line up at the equator of the spindle apparatus?
 - A) prophase
 - B) metaphase
 - C) anaphase
 - D) telophase
 - E) The chromosomes do not line up at all.
- 12) Cytokinesis is evident in animal cells when
 - A) contractile ring forms around the equator.
 - B) chromosomes are observable.
 - C) cell plate formation occurs.
 - D) a spindle apparatus forms.
 - E) prophase begins.
- 13) Sexual reproduction by necessity involves which two processes?
 - A) meiosis and fertilization
 - B) mutation and translocation
 - C) nondisjunction and pleiotropy
 - D) mitosis and fertilization
 - E) differentiation and specialization

- 14) Meiosis can occur
- A) in all organisms.
 - B) only in diploid organisms.
 - C) only in multicellular organisms.
 - D) only in haploid organisms.
 - E) only in unicellular organisms.
- 15) Gametes differ from body cells in
- A) having only one member of each pair of homologous chromosomes.
 - B) being haploid.
 - C) functioning in sexual reproduction.
 - D) having half the amount of genetic material.
 - E) All the above choices are correct.
- 16) Meiosis
- A) is a purely random division of chromosomes.
 - B) doubles the number of chromosomes.
 - C) reduces the number of chromosomes by half.
 - D) does not change the number of chromosomes.
 - E) allows chromosomes to split in half.
- 17) Which of the following is a major difference between reproductive cloning and therapeutic cloning.
- A) Reproductive cloning uses denucleated eggs while therapeutic cloning used nucleated eggs.
 - B) For reproductive cloning the somatic cells used as a source of genetic information come from healthy tissue, for therapeutic cloning the cells come from disease tissues.
 - C) In reproductive cloning the cloned embryo is to be implanted in the uterus of a surrogate mother, while for therapeutic cloning it used as a source of stem cells.
 - D) Reproductive cloning is used to produced genetically identical copies of individuals, while therapeutic cloning, the new individuals have genetic defects repaired.
- 18) About $\frac{1}{4}$ of all Americans will develop cancer. Which of the following is one possible cause of cancer?
- A) Cancer results from errors in mitosis where anaphase occurs before prophase.
 - B) Cancer results from errors in DNA replication where the DNA polymerase inserts the wrong nucleotide in the growing DNA chain.
 - C) Cancer results from errors in translation where the wrong tRNA gets inserted in the ribosome.
 - D) Cancer results from errors in cell division where meiosis occurs instead of the normal mitosis.
 - E) Cancer results from errors in transcription were terminators fail to trigger transcriptional termination.

21. What is the fate of chromosome dyads during anaphase of mitosis?

22. Discuss the similarities and differences of cytokinesis in animal and plant cells.

23. What is the goal of therapeutic cloning?