

HA Practice Questions for Quarter 1 Final Exam 2018-2019

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- 1) Cells from advanced malignant tumors frequently have very abnormal chromosomes as well as an abnormal number of chromosomes. What might explain the association between malignant tumors and chromosomal abnormalities?
 - A) Cancer cells replicate chromosomes multiple times per cell cycle.
 - B) Cancer cells are no longer anchorage dependent.
 - C) Cell cycle checkpoints are not in place to stop cells with chromosome abnormalities.
 - D) Cells with abnormal chromosomes have increased metabolism.
- 2) Which of the following is released by platelets in the vicinity of an injury?
 - A) PDGF
 - B) separase
 - C) protein kinase
 - D) cyclin
- 3) Density-dependent inhibition is explained by which of the following?
 - A) As cells become more numerous, they begin to squeeze against each other, restricting their size and ability to produce growth factors.
 - B) As cells become more numerous, the protein kinases they produce begin to compete with each other, such that the proteins produced by one cell essentially cancel those produced by its neighbor.
 - C) As cells become more numerous, the cell surface proteins of adjacent cells bind to each other and send signals that inhibit cell division.
 - D) As cells become more numerous, the level of waste products increases, eventually slowing down metabolism.
- 4) Besides the ability of some cancer cells to divide uncontrollably, what else could logically result in a tumor?
 - A) enhanced anchorage dependence
 - B) changes in the order of cell cycle stages
 - C) lack of appropriate cell death
 - D) inability to form spindles
- 5) Most animal cells exhibit anchorage dependence, which means that in order to divide
 - A) all chromosomes must be attached to spindle microtubules.
 - B) nonkinetochore microtubules from opposite poles must overlap and be attached by motor proteins.
 - C) cell-surface phospholipids must be attached to those of adjoining cells.
 - D) cells must be attached to a substrate or extracellular matrix of a tissue.
- 6) Researchers began a study of a cultured cell line. Their preliminary observations showed them that the cell line did not exhibit either density-dependent inhibition or anchorage dependence. What could they conclude right away?
 - A) The cells originated in the nervous system.
 - B) The cells show characteristics of tumors.

- C) The cells have altered series of cell cycle phases.
 - D) The cells were originally derived from an elderly organism.
- 7) You have a series of cells, all of which were derived from tumors. How might you determine which ones are malignant?
- A) Identify the ones that are not dividing uncontrollably.
 - B) Identify the ones with higher rates of apoptosis.
 - C) Prepare karyotypes to identify the ones with aberrant chromosome number or structure.
 - D) Identify the ones with elongated cell cycles.
- 8) One possible result of chromosomal breakage is for a fragment to join a nonhomologous chromosome. What is this alteration called?
- A) deletion
 - B) transversion
 - C) inversion
 - D) translocation
 - E) duplication
- 9) Abnormal chromosomes are frequently found in malignant tumors. Errors such as translocations may place a gene in close proximity to different control regions. Which of the following might then occur to make the cancer worse?
- A) an increase in nondisjunction
 - B) expression of inappropriate gene products
 - C) a decrease in mitotic frequency
 - D) death of the cancer cells in the tumor
- 10) What is the source of the extra chromosome 21 in an individual with Down syndrome?
- A) nondisjunction in the mother only
 - B) nondisjunction in the father only
 - C) duplication of the chromosome
 - D) nondisjunction or translocation in either parent
- 11) A couple has a child with Down syndrome. The mother is 39 years old at the time of delivery. Which of the following is the most probable cause of the child's condition?
- A) The woman inherited this tendency from her parents.
 - B) One member of the couple carried a translocation.
 - C) One member of the couple underwent nondisjunction in somatic cell production.
 - D) One member of the couple underwent nondisjunction in gamete production.
 - E) The mother had a chromosomal duplication.
- 12) Which of the following is known as a *Philadelphia chromosome*?
- A) a human chromosome 22 that has had a specific translocation
 - B) a human chromosome 9 that is found only in one type of cancer
 - C) an animal chromosome found primarily in the mid-Atlantic area of the United States
 - D) an imprinted chromosome that always comes from the mother

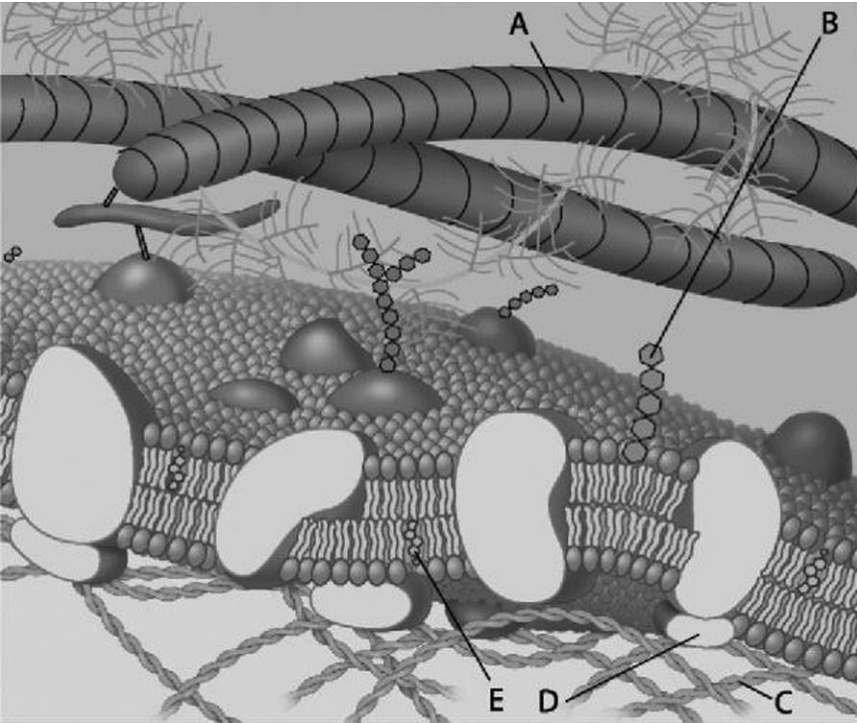
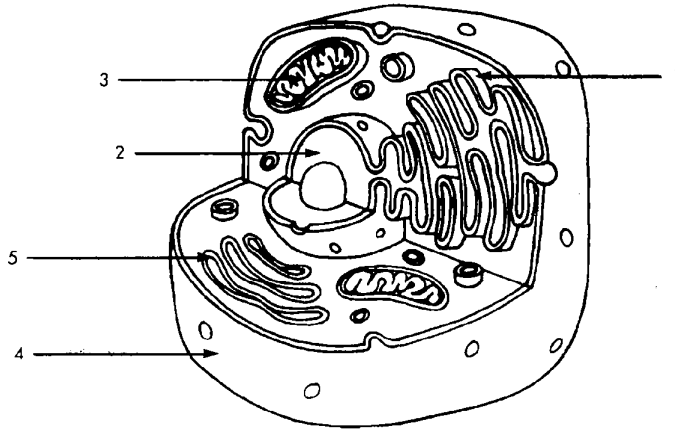


Figure 5.1

For the following questions, match the labeled component of the cell membrane in Figure 5.1 with its description.

- 13) Which component in the figure is cholesterol?
 - A) A
 - B) B
 - C) C
 - D) D
 - E) E
- 14) Which component in the figure is a microfilament of the cytoskeleton?
 - A) A
 - B) B
 - C) C
 - D) D
 - E) E
- 15) Which component in the figure helps membranes resist changes in fluidity at high and low temperatures?
 - A) A
 - B) B
 - C) C
 - D) D
 - E) E
- 16) Which of the following is characteristic of prokaryotes?
 - A) They have a nucleus.

- B) They were found on Earth before eukaryotes.
 C) The organelles in their cytoplasm are surrounded by membranes.
 D) None of the above
- 17) Only eukaryotic cells have
 A) DNA. C) ribosomes.
 B) membrane-bound organelles. D) cytoplasm.
- 18) Cell membranes
 A) are only found on a small number of cells.
 B) contain genes.
 C) are made of DNA.
 D) are thin coverings that surround cells.
- 19) A protein that fits into the cell membrane
 A) has two polar end sections that bond with water.
 B) floats in the cell membrane.
 C) has a nonpolar middle section.
 D) All of the above
- 20) The cell membrane
 A) encloses the contents of a cell.
 B) allows material to enter and leave the cell.
 C) is selectively permeable.
 D) All of the above
- 21) A structure within a cell that performs a specific function is called a(n)
 A) organelle. C) tissue.
 B) organ tissue. D) biocenter.
- 22) Golgi apparatus are organelles that
 A) receive proteins and lipids from the endoplasmic reticulum.
 B) label the molecules made in the endoplasmic reticulum with tags that specify their destination.
 C) release molecules in vesicles.
 D) All of the above
- 23) In which of the following organelles is a cell's ATP produced?
 A) mitochondrion C) Golgi apparatus
 B) endoplasmic reticulum D) lysosome
- 24) Proteins are made in cells on the
 A) mitochondria. C) nucleus.
 B) ribosomes. D) cell membrane.
- 25) The double membrane surrounding the nucleus is called the
 A) nucleolus. C) nucleoplasm.
 B) nuclear wall. D) nuclear envelope.



- 26) Refer to the illustration above. The cell uses structure “3”
- A) to transport material from one part of the cell to the other.
 - B) to package proteins so they can be stored by the cell.
 - C) as a receptor.
 - D) to produce energy.
- 27) Refer to the illustration above. Structure “1” is
- A) the endoplasmic reticulum.
 - B) a Golgi apparatus.
 - C) a mitochondrion.
 - D) the nucleus.
- 28) Refer to the illustration above. In eukaryotic cells, chromosomes are found in
- A) structure “1.”
 - B) structure “2.”
 - C) structure “3.”
 - D) structure “5.”
- 29) Refer to the illustration above. The cell shown is probably an animal cell because
- A) it has mitochondria.
 - B) it does not have a cell wall.
 - C) it has a cell membrane.
 - D) it does not have a nucleus.
- 30) All the following are found in both plant and animal cells, *except*
- A) a cell wall.
 - B) a cell membrane.
 - C) mitochondria.
 - D) the endoplasmic reticulum.
- 31) Which of the following associations between a type of animal tissue and its primary function is *incorrect*?
- A) connective tissue—transport of substances around the body
 - B) epithelial tissue—protective surface coverings
 - C) muscle tissue—contraction
 - D) nervous tissue—receiving and transmitting messages
- 32) Chromatids are
- A) dense patches within the nucleus.
 - B) bacterial chromosomes.
 - C) joined strands of duplicated genetic material.
 - D) prokaryotic nuclei.
- 33) Which of the following is *not* a true difference between the chromosomes of eukaryotes and those of prokaryotes?
- A) Eukaryotic chromosomes are linear, while those of prokaryotes are circular.
 - B) Eukaryotic chromosomes are associated with histones, while those of prokaryotes are not.
 - C) Eukaryotes usually have more than one chromosome, while prokaryotes have only one

chromosome.

D) Eukaryotic chromosomes contain DNA, while prokaryotic chromosomes contain a different form of genetic material.

- 34) A student can study a karyotype to learn about the
- A) molecular structure of a chromosome.
 - B) genes that are present in a particular strand of DNA.
 - C) medical history of an individual.
 - D) chromosomes present in a somatic cell.
- 35) The chromosome of a bacterium
- A) is wrapped around proteins.
 - B) has a circular shape.
 - C) occurs in multiple pairs within the cell.
 - D) is found within the nucleus.

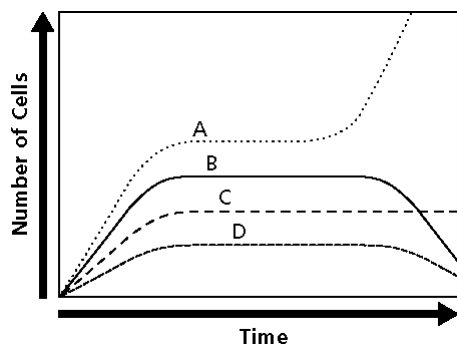
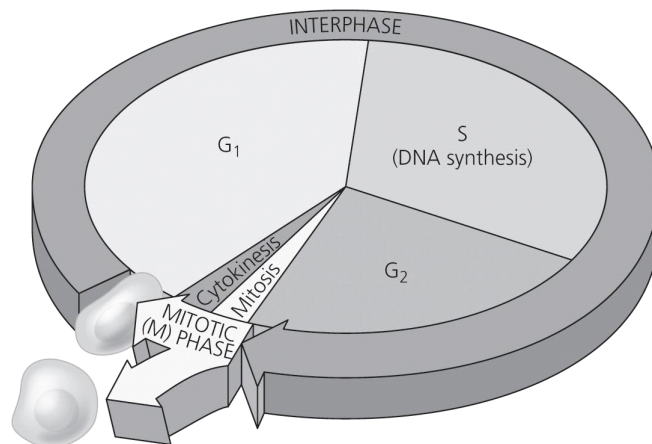


Figure 9-2

- 36) Which of the cells depicted in the line graph in Figure 9-2 are most likely cancerous?
- A) A
 - B) B
 - C) C
 - D) D
- 37) If cancer is present, what is the likely explanation for what happened to the cells depicted in the curves labeled B and D in Figure 9-2?
- A) They thrived with the cancerous cells.
 - B) They were harmed by radiation therapy.
 - C) They died off due to natural causes.
 - D) They died off because the cancerous cells deprived them of nutrients.
- 38) The cell cycle is regulated by
- A) cyclins
 - B) enzymes
 - C) hormones
 - D) sugars
- 39) Cancer cells can reproduce rapidly because they
- A) are smaller than normal cells.
 - B) bypass interphase.
 - C) undergo mitosis faster
 - D) spend less time in interphase
- 40) What is cancer caused by?
- A) cell-membrane damage
 - B) metabolic poisoning
 - C) mutation
 - D) immune-system damage
- 41) It is often said that normal cells change into cancerous cells frequently in our bodies. Which of the following explanations accounts for the relative rarity of cancer?

- A) The cancerous cells die on their own.
 - B) The DNA repair system fixes the mutation that causes cancer.
 - C) The cancer cells grow only very slowly at first.
 - D) The cancerous cells are normally crowded out by normal cell growth.
- 42) What is the role of cyclin-dependent kinases in the cell cycle?
- A) They stop the cycle if something has gone wrong.
 - B) They catalyze the condensation of the chromosomes.
 - C) They provide the energy for the actions of the spindle fibers.
 - D) They initiate various stages of the cell cycle.
- 43) If you were studying the causes of cancer, which topic might interest you?
- A) cyclin-dependent kinases
 - B) centromere structure
 - C) spindle-fiber structure
 - D) cell membranes
- 44) The typical growth period of a cell occurs during which stage of the cell cycle?
- A) Gap 1
 - B) Gap 2
 - C) synthesis
 - D) mitosis
- 45) Some cancers have a genetic component to them, if a parent has a cancer the children are more likely than the average population to develop the cancer. Why might this be?
- A) Cancers require more than one mutation to occur.
 - B) Cancers are inherited but remain dormant until a certain age.
 - C) Parents and children are often exposed to similar environmental factors.
 - D) Cancers are often recessive traits and require alleles from both parents.
- 46) Colchicine is a chemical that when applied to a cell during mitosis can be used to “freeze” cells in metaphase by preventing the chromosomes from moving away from the metaphase plate. What part of the cell does colchicine most likely affect?
- A) chromosome structure
 - B) spindle fibers
 - C) nuclear membrane
 - D) cell membrane
- 1) In a dividing cell, the mitotic (M) phase alternates with interphase (I), a growth period.



Select the part of the cell cycle where the cell actually produces two new identical cells.

- A) G_1 where the cell grows and duplicates cellular organelles.
- B) S when the DNA replicates to make two copies.

- C) G_2 when a gap forms separating the chromosomes into two areas in the cell.
 - D) Cytokinesis when the cytoplasm divides forming two new cells.
- 2) Density-dependent inhibition is a phenomenon in which crowded cells stop dividing at some optimal density and location. This phenomenon involves binding of a cell-surface protein to its counterpart on an adjoining cell's surface. A growth inhibiting signal is sent to both cells, preventing them from dividing. Certain external physical factors can affect this inhibition mechanism.

Select the statement that makes a correct prediction about natural phenomena that could occur during the cell cycle to prevent cell growth.

- A) As cells become more numerous, they begin to squeeze against each other, restricting their size and ability to allow cell growth.
 - B) As cells become more numerous, the protein kinases they produce begin to compete with each other until only one cell has the proteins necessary for growth.
 - C) As cells become more numerous, the amount of required growth factors and nutrients per cell becomes insufficient to allow for cell growth.
 - D) As cells become more numerous, more and more of them enter the synthesis part of the cell cycle and duplicate DNA to inhibit cell growth.
- 3) During meiosis, a defect occurs in a cell that results in the failure of microtubules, spindle fibers, to bind at the kinetochores, a protein structure on chromatids where the spindle fibers attach during cell division to pull sister chromatids apart. Which of the following is the most likely result of such a defect?
- A) New microtubules with more effective binding capabilities to kinetochores will be synthesized to compensate for the defect.
 - B) Excessive cell divisions will occur resulting in cancerous tumors and an increase in the chromosome numbers known as polyploidy.
 - C) The defect will be bypassed in order to and ensure normal chromosome distribution in the new cells.
 - D) The resulting cells will not receive the correct number of chromosomes in the gametes, a condition known as aneuploidy.