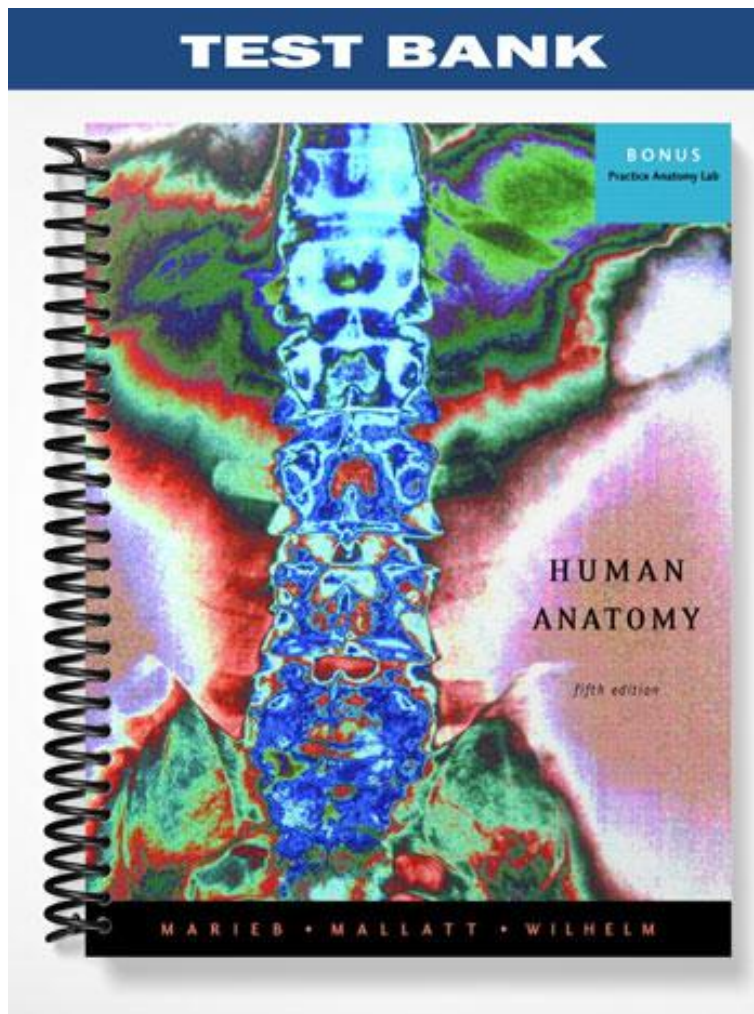


TEST BANK



BONUS
Practice Anatomy Lab

**HUMAN
ANATOMY**

fifth edition

MARBIEB • MALLATT • WILHELM

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

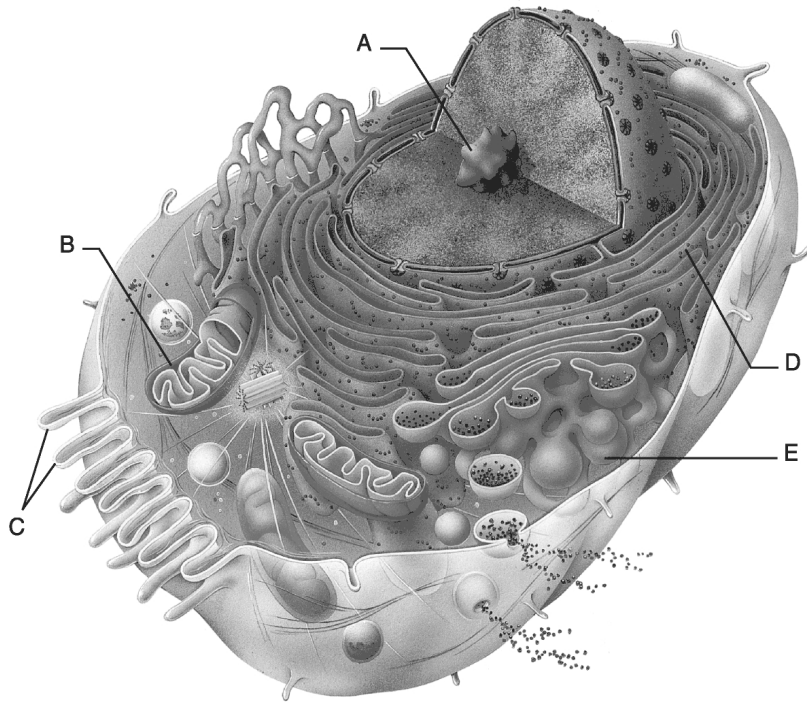


Figure 2.1

Using Figure 2.1, match the following:

1) Rough endoplasmic reticulum

Answer: D

1) _____

2) Nucleolus

Answer: A

2) _____

3) Microvilli

Answer: C

3) _____

4) Mitochondrion

Answer: B

4) _____

5) Golgi apparatus

Answer: E

5) _____

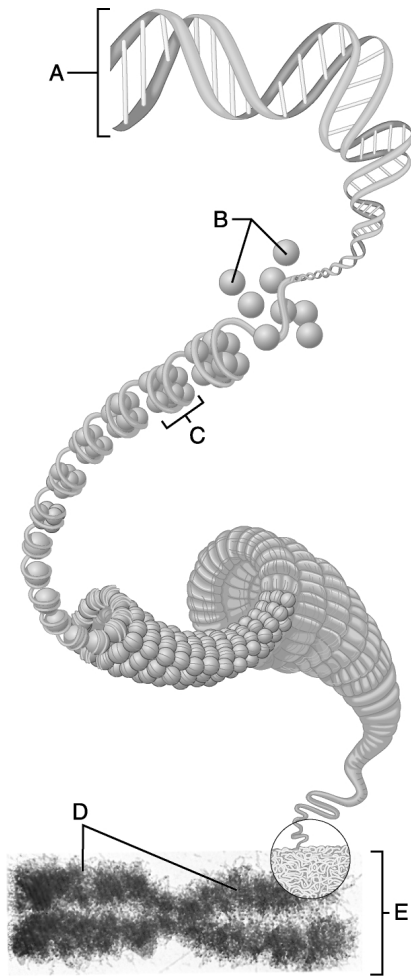


Figure 2.2

Using Figure 2.2, match the following:

6) DNA molecule

Answer: A

6) _____

7) Chromatid

Answer: D

7) _____

8) Nucleosomes

Answer: C

8) _____

9) Histones

Answer: B

9) _____

10) Metaphase chromosome

Answer: E

10) _____

Match the following:

- A. Golgi apparatus
- B. lysosome
- C. rough endoplasmic reticulum
- D. mitochondria
- E. centrosome

- 11) This organelle is involved in production of cellular energy. 11) _____
Answer: mitochondria
- 12) This structure is characterized by folded membranes called cristae. 12) _____
Answer: mitochondria
- 13) When a cell ingests a foreign cell, the vesicle fuses with this organelle. 13) _____
Answer: lysosome
- 14) This membranous structure is the site of protein synthesis. 14) _____
Answer: rough endoplasmic reticulum
- 15) A spherical, nonmembranous structure near the nucleus. 15) _____
Answer: centrosome
- 16) Cisternae of this structure are continuous with the nuclear envelope. 16) _____
Answer: rough endoplasmic reticulum
- 17) This structure has both a cis and a trans face. 17) _____
Answer: Golgi apparatus
- 18) This structure consists of a cloud of proteins surrounding a pair of centrioles. 18) _____
Answer: centrosome
- 19) These structures are often called the demolition crew of the cell. 19) _____
Answer: lysosome
- 20) This structure primarily modifies products from the rough ER, and is characterized by a flattened stack of membranes. 20) _____
Answer: Golgi apparatus
- 21) These structures are primarily sacs of powerful enzymes. 21) _____
Answer: lysosome
- 22) These structures are defective in the disorder Tay Sachs disease. 22) _____
Answer: lysosome
- 23) The lysosomes are derived from this structure. 23) _____
Answer: Golgi apparatus

- 24) These structures produce ATP. 24) _____
Answer: mitochondria
- 25) These structures contain their own DNA. 25) _____
Answer: mitochondria

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 26) The smooth ER contains its own molecules of DNA. 26) _____
Answer: True False
- 27) Clathrin-coated regions of the plasma membrane are locations where exocytosis occurs. 27) _____
Answer: True False
- 28) Ribosomes consist of two subunits, each surrounded by a membrane. 28) _____
Answer: True False
- 29) Peroxisomes are important in detoxification of a number of toxic substances, for instance hydrogen peroxide. 29) _____
Answer: True False
- 30) The majority of the DNA in a cell is found in the nucleolus. 30) _____
Answer: True False
- 31) Microtubules are composed of actin. 31) _____
Answer: True False
- 32) Chromatin is composed of DNA wound around proteins known as actin. 32) _____
Answer: True False
- 33) An example of a type of cell with high rates of mitosis is a cell of the skin. 33) _____
Answer: True False
- 34) During the G1 phase, cells are characterized by rapid growth. 34) _____
Answer: True False
- 35) During the S phase, DNA is replicated in the cytoplasm. 35) _____
Answer: True False
- 36) Smooth and skeletal muscles are characterized by much actin and myosin. 36) _____
Answer: True False
- 37) Extended chromatin is tightly wound around histones. 37) _____
Answer: True False
- 38) A mitotic spindle develops during early prophase of mitosis. 38) _____
Answer: True False

39) During anaphase, the chromosomes are pulled toward the center of the cell. 39) _____

Answer: True False

40) Cytokinesis is the physical division of the cells. 40) _____

Answer: True False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

41) Mitosis refers only to nuclear division. Separation of the entire cell following mitosis is 41) _____

- A) meiosis. B) telophase. C) cytokinesis. D) karyokinesis.

Answer: C

42) Phospholipids of the plasma membrane are arranged 42) _____

- A) with their nonpolar tails sandwiched between the heads.
B) around a central layer of cholesterol.
C) in a single layer with polar heads facing outwards.
D) with their polar heads sandwiched between the tails.

Answer: A

43) Which of the following cytoskeleton elements are the thinnest? 43) _____

- A) intermediate filaments B) centrioles
C) microtubules D) microfilaments

Answer: D

44) Which of the following statements about integral proteins in the plasma membrane is false? 44) _____

- A) Some attach to the glycocalyx.
B) They determine which molecules are transported through the membrane.
C) Most extend all the way through the membrane.
D) They are more abundant by volume than the membrane phospholipids.

Answer: D

45) Which type of endocytosis engulfs the most specific type of molecule or material? 45) _____

- A) receptor-mediated endocytosis B) pinocytosis
C) fluid-phase endocytosis D) phagocytosis

Answer: A

46) Products of gland cells are secreted by 46) _____

- A) osmosis. B) exocytosis. C) phagocytosis. D) pinocytosis.

Answer: B

47) Of the following, the only organelle that has a double membrane structure is the 47) _____

- A) Golgi apparatus. B) endoplasmic reticulum.
C) centriole. D) mitochondrion.

Answer: D

48) Functions of the Golgi apparatus include all of the following *except* 48) _____

- A) plasma membrane formation. B) synthesis of lysosomes.
C) production of secretory granules. D) DNA replication.

Answer: D

49) Tay-Sachs disease is a lysosome storage disease, of which there are many types, all characterized by the absence of some functional acid hydrolase. The cells of individuals with a lysosome storage disease have _____
A) abnormally large lysosomes. B) no lysosomes.
C) abnormally small lysosomes. D) lysosomes that are structurally normal.

Answer: A

50) Which of the following is *not* a cytoskeleton element? _____
A) intermediate filaments B) centrioles
C) microfilaments D) microtubules

Answer: B

51) Which type of protein is required for exocytosis? _____
A) clathrin B) SNARE
C) caveolin D) coatomer proteins

Answer: B

52) In chromatin, the DNA molecule wraps around proteins called _____
A) codons. B) integral protein.
C) histones. D) nucleotides.

Answer: C

53) In the cell life cycle, DNA is replicated during _____
A) interphase "G1." B) prophase II.
C) prophase I. D) interphase "S."

Answer: D

54) The longest arrays of microtubules that assemble on the centrioles during prophase form filaments called _____
A) kinetochores. B) asters.
C) the mitotic spindle. D) the nuclear envelope.

Answer: C

55) During mitosis, contractions of the mitotic spindle serve to _____
A) re-form the nuclear envelope.
B) form the aster.
C) pull together the replicated chromosomal strands.
D) separate the chromatids at the centromere.

Answer: D

56) The _____ face of the Golgi apparatus is _____ to receive spherical vesicles from the rough endoplasmic reticulum. _____
A) *trans*; concave B) *cis*; flattened C) *trans*; convex D) *cis*; convex

Answer: D

57) Which membranous organelle stores calcium? _____
A) Golgi apparatus B) peroxisomes
C) mitochondria D) endoplasmic reticulum

Answer: D

- 58) Which organelle is important in neutralizing free radicals? 58) _____
A) Golgi apparatus B) lysosomes
C) peroxisomes D) mitochondria
Answer: C
- 59) Which of the following is the function of the nuclear envelope? 59) _____
A) protein synthesis
B) regulation of passage of substances in and out of the cell membrane
C) transcription of DNA
D) separation of nucleoplasm and cytoplasm
Answer: D
- 60) Peroxisomes function to 60) _____
A) produce pigments. B) store cellular free radicals.
C) form and degrade hydrogen peroxide. D) regulate membrane permeability.
Answer: C
- 61) Dyneins and kinesins 61) _____
A) resist pulling forces that are placed on cells.
B) push and pull on chromosomes to align them during metaphase of mitosis.
C) enable a cell to send out and retract extensions called pseudopods.
D) move organelles along microtubules through the cytoplasm.
Answer: D
- 62) Cell division is analogous to 62) _____
A) a building forming another building by random accumulation of materials.
B) two buildings duplicating their parts and fusing.
C) a building forming another building through a loss of some of its parts.
D) a building duplicating its blueprint and then forming a new building by splitting in two.
Answer: D
- 63) The plasma membrane is important for all the following reasons *except* 63) _____
A) it surrounds the cell contents.
B) it acts as a site for cell-to-cell interaction and recognition.
C) it determines what substances enter and exit the cell.
D) it is so thick and rigid, it offers some protection to the cell.
Answer: D
- 64) The plasma membrane is composed of all of the following *except* 64) _____
A) glycoproteins. B) phospholipids. C) cholesterol. D) tubulin protein.
Answer: D
- 65) Materials that are to be exocytosed by cells are packed by the 65) _____
A) nucleosome. B) mitochondrion.
C) Golgi apparatus. D) ribosome.
Answer: C

- 66) Which of the following does not pass through nuclear pores? 66) _____
 A) messenger RNA B) water and electrolytes
 C) chromatin D) proteins
 Answer: C
- 67) Which of the following is associated with protein synthesis? 67) _____
 A) chloroplasts B) ribosomes
 C) smooth endoplasmic reticulum D) mitochondria
 Answer: B
- 68) Ribosomes may be either free within the cytoplasm or bound to a channeling system known as the 68) _____
 A) cytoskeleton. B) microtubule organizing center.
 C) Golgi apparatus. D) rough endoplasmic reticulum.
 Answer: D
- 69) Which is not part of interphase? 69) _____
 A) S B) G₁ C) M D) G₂
 Answer: C
- 70) In the plasma membrane of cells, cholesterol acts to 70) _____
 A) stabilize the membrane.
 B) make the membrane more resistant to freezing.
 C) participate in pinocytosis.
 D) destabilize the membrane, leading to heart attacks.
 Answer: A
- 71) The endocytotic process in which tiny packets of fluid are brought into the cell is called 71) _____
 A) exocytosis. B) pinocytosis. C) xenocytosis. D) phagocytosis.
 Answer: B
- 72) The double membrane structure is unique to the 72) _____
 A) peroxisome. B) lysosome. C) mitochondrion. D) nucleolus.
 Answer: C
- 73) Mitochondria 73) _____
 A) are single-membrane structures involved in the breakdown of ATP.
 B) are always the same shape.
 C) synthesize proteins for use outside the cell.
 D) contain some of the code necessary for their own duplication.
 Answer: D
- 74) The stiffest elements of the cytoskeleton, analogous to the bones of the human body, are 74) _____
 A) the cytosol. B) intermediate filaments.
 C) microtubules. D) microfilaments.
 Answer: C
- 75) The mitotic spindle forms from the 75) _____
 A) Golgi apparatus. B) nucleolus.
 C) nucleus. D) centrioles.
 Answer: D

76) The nuclear envelope is continuous with the rough ER, but it differs from the rough ER in that it 76) _____
A) is not associated with ribosomes.
B) consists of two membranes separated by a space.
C) has unique pores.
D) consists of tubes like the smooth ER.

Answer: C

77) Membrane-bound organelles have the same type of membrane as the plasma membrane except 77) _____
A) they are all covered with ribosomes. B) for the absence of cholesterol.
C) for the absence of a glycocalyx. D) the nonpolar tails face outward.

Answer: C

78) In the process of phagocytosis, the organelles whose enzymes break down ingested foreign cells 78) _____
are the
A) smooth endoplasmic reticulum. B) lysosomes.
C) peroxisomes. D) nucleoli.

Answer: B

79) During mitosis, the kinetochore microtubules of the mitotic spindle 79) _____
A) pull on the chromatids and align them at the metaphase plate.
B) push the two poles of the cell apart.
C) anchor the centriole to the cell membrane.
D) push on the chromatids.

Answer: A

80) The theory that proposes that aging results from the effects of free radicals is primarily a theory of 80) _____
A) cross-linking of glucose. B) wear and tear.
C) genetically programmed aging. D) progressive disorder of immunity.

Answer: B

81) The cytoskeletal elements that are analogous to the muscles of the body in that they help generate 81) _____
contractile forces are
A) microtubules. B) integral proteins.
C) microfilaments. D) intermediate filaments.

Answer: C

82) Transcription of DNA requires the presence of 82) _____
A) histones. B) nucleosomes.
C) extended chromatin. D) centrosomes.

Answer: C

83) The process of cellular aging may involve each of the following except 83) _____
A) progressive shortening of telomeres. B) accumulated damage by free radicals.
C) excessive metabolic rate. D) decreased production of lysosomes.

Answer: D

84) During what phase of mitosis does the mitotic spindle break down and disappear? 84) _____
A) metaphase B) telophase C) anaphase D) late prophase

Answer: B

85) The cytoskeletal elements that form a ring to "squeeze" the two daughter cells apart during cytokinesis are 85) _____
A) microfilaments. B) the microtrabecular lattice.
C) intermediate filaments. D) microtubules.

Answer: A

86) During what phase of mitosis is the DNA duplicated? 86) _____
A) interphase B) prophase C) metaphase D) anaphase

Answer: A

87) The plasma membrane is 87) _____
A) a single-layered membrane enclosing the plasma.
B) a single-layered membrane that surrounds the nucleus of the cell.
C) a membrane composed of tiny shelves or cristae.
D) the membrane surrounding the cell.

Answer: D

88) Which of the following cellular phenomena would *not* be affected by the absence of microtubules? 88) _____
A) the arrangement of organelles B) cell shape
C) cell division D) energy production (ATP manufacture)

Answer: D

89) Lysosomes originate from 89) _____
A) smooth endoplasmic reticulum. B) the Golgi apparatus.
C) the plasma membrane. D) cholesterol.

Answer: B

90) Which of the following is an inclusion, *not* an organelle? 90) _____
A) mitochondrion B) microtubule C) glycogen D) lysosome

Answer: C

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

91) This phase is the physical division of two cells during mitosis. 91) _____
Answer: cytokinesis

92) These structures give scientists clues about cellular senescence. 92) _____
Answer: telomeres

93) Cell aging may be related to production of what chemicals produced by the mitochondria? 93) _____
Answer: radicals (free radicals)

94) This is the collective name for short carbohydrates on the extracellular surface of integral proteins, which help cells recognize each other. 94) _____
Answer: glycocalyx

95) This is the name of a cluster of DNA wrapped around a group of eight histones. 95) _____
Answer: nucleosome

- 96) This is the phase in which a cell grows and carries on all its usual activities except for division. 96) _____
 Answer: interphase
- 97) These are the smallest living units in the body. 97) _____
 Answer: cells
- 98) This is the outer physical boundary of a human cell. 98) _____
 Answer: plasma membrane (plasmalemma)
- 99) This is the name for the currently held theory describing the plasma membrane. 99) _____
 Answer: fluid mosaic model
- 100) The plasma membrane is primarily composed of this type of fat molecule. 100) _____
 Answer: phospholipid
- 101) This type of membrane protein is attached to only one side of the plasma membrane. 101) _____
 Answer: peripheral protein
- 102) This is the mechanism by which large particles enter a cell. 102) _____
 Answer: endocytosis
- 103) Coated pits are covered with this molecule. 103) _____
 Answer: clathrin
- 104) This is the type of protein involved in transport mechanisms across the plasma membrane. 104) _____
 Answer: integral proteins
- 105) This is a genetic disease that leads to very high cholesterol in the blood. 105) _____
 Answer: familial hypercholesterolemia

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 106) Differentiate between phagocytosis and receptor-mediated endocytosis.
 Answer: In phagocytosis, the cell extends pseudopods and engulfs the particle. In receptor-mediated endocytosis, the cell membrane forms in-pocketings called caveolae lined with the protein clathrin, and binds to membrane receptors, causing it to be enveloped.
- 107) Describe the action of exocytosis and the SNAREs.
 Answer: Exocytosis is the process by which a cell expels materials. These molecules are within a lipid bound secretory vesicle with a vesicle SNARE, which binds to the plasma membrane SNARE, causing the vesicle phospholipid molecules to fuse with the plasma membrane phospholipid molecules, and the molecules are expelled from the cell.
- 108) Describe the two checkpoints that occur during interphase.
 Answer: The first checkpoint, G₁, ensures that the cell has grown enough and replicated the necessary organelles and other structures to synthesize DNA. The second checkpoint, G₂, checks to see whether errors occurred during DNA synthesis.

109) Describe the mitochondria.

Answer: These are long and thin organelles, contain their own DNA involved in their own replication, and move within the cell to sites where they are needed. They produce ATP molecules, which are the equivalent of cellular energy. They are bound by two membranes, the inner one is highly folded into cristae, where many of the critical molecules involved in energy production are imbedded.

110) Describe the three major types of cytoskeletal elements.

Answer: Microtubules are the largest and are formed by the protein tubulin. They are stiff, but bendable. Microfilaments are the thinnest, and are strands of the protein actin, and are contractile, and are typically very labile. Intermediate filaments are of intermediate diameter, and are very stable and permanent, functioning as support structures, as well as holding cells together.