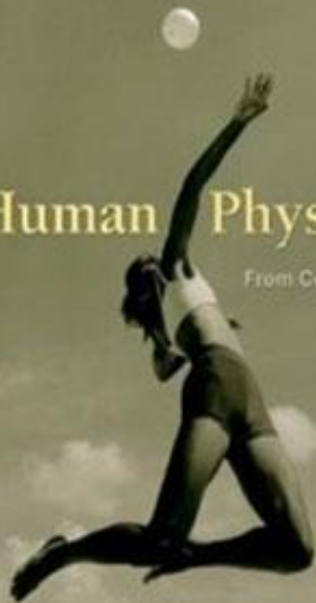


TEST BANK



Human Physiology Sixth Edition

From Cells to Systems



Lauralee Sherwood

Chapter 2--Cell Physiology

Student: _____

1. Which component below is not always found in a typical human cell?

- A. cytosol.
- B. DNA.
- C. flagellum.
- D. plasma membrane.
- E. water.

2. A typical human cell is about _____ micrometers in diameter.

- A. 1 to 2
- B. 10 to 20
- C. 80 to 100
- D. 150 to 200
- E. 200 to 300

3. Select the structure that is not located in the cytosol of the cell.

- A. ER.
- B. Golgi complex.
- C. lysosome.
- D. mitochondrion.
- E. nucleolus.

4. Which organelle is not membrane-bound?

- A. Golgi body.
- B. lysosome.
- C. mitochondrion.
- D. RER.
- E. ribosome.

5. Which of the following statements concerning cells is incorrect?

- A. Cells serve as the living building blocks of the body.
- B. The average human cell is about one hundred times smaller than the smallest particle visible by the unaided eye.
- C. Inanimate chemical molecules are organized within each cell into a living entity.
- D. Cells are generally colorless and transparent so they must be stained for visualization under a microscope.
- E. The three major subdivisions of a cell are the plasma membrane, the nucleus, and the cytoplasm.

6. Select the incorrect statement regarding the plasma membrane.

- A. serves as a mechanical barrier to hold in the contents of the cell.
- B. selectively controls movement of molecules between the ECF and the ICF.
- C. is the barrier that surrounds the blood vessels and separates the blood plasma from the interstitial fluid.
- D. contains proteins that provide membrane functions.
- E. has cholesterol to maintain rigidity.

7. The rough endoplasmic reticulum:

- A. is studded with ribosomes.
- B. synthesizes proteins for export from the cell or for use in construction of a new cellular membrane.
- C. is continuous with the smooth endoplasmic reticulum.
- D. is connected to the nucleus.
- E. all of these answers.

8. The rough ER is a membranous system associated with:

- A. chromosomes.
- B. lysosomes.
- C. microfilaments.
- D. ribosomes.
- E. vacuoles.

9. Of the organelles below which occurs in the lowest numbers within a typical human cell?

- A. mitochondria.
- B. vaults.
- C. peroxisomes.
- D. lysosomes.
- E. nuclei.

10. Which of the following is contained within the nucleus?

- A. deoxyribonucleic acid.
- B. cytosol.
- C. plasma membrane.
- D. endoplasmic reticulum.
- E. none of these answers.

11. Select the incorrect statement regarding ribosomes:

- A. They are composed of RNA.
- B. They assemble polypeptides.
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- C. ribophorins.
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- A. is most abundant in cells specialized for protein secretion.
- B. gives rise to transport vesicles containing newly synthesized molecules wrapped in a layer of smooth ER membrane.
- C. consists of stacks of relatively flattened sacs called cisternae.
- D. has many ribosomes.
- E. all of these answers.

14. Smooth ER in liver cells have:

- A. increased numbers of ribosomes.
- B. a sarcoplasmic reticulum for storing calcium.
- C. enzymes to detoxify harmful substances.
- D. no interactions with any other organelles.
- E. none of these answers.

15. Select the incorrect statement about the smooth ER.

- A. It is abundant in most cell types.
- B. It is found in liver cells.
- C. It specializes in lipid metabolism.
- D. The sarcoplasmic reticulum is a modified form of it.
- E. This organelle does not contain ribosomes.

16. Which structure is not associated with the secretion of proteins produced by ER?

- A. Golgi complex.
- B. smooth ER.
- C. transport vesicles.
- D. lysosomal membrane.
- E. plasma membrane.

17. Which characteristic of the Golgi complex is incorrect?

- A. They sort and direct products to their final destination.
- B. They modify proteins chemically.
- C. They produce secretory vesicles.
- D. They produce proteins using ribosome.
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18. Which of the following does not apply to lysosomes?

- A. They contain powerful hydrolytic enzymes.
- B. They generate hydrogen peroxide.
- C. They remove useless parts of the cell.
- D. They attack material engulfed by the cell by means of endocytosis.
- E. They play an important role in tissue regression.

19. Extrusion of materials to the exterior of the cell through the plasma membrane is called:

- A. endocytosis
- B. exocytosis
- C. phagocytosis
- D. pinocytosis
- E. all of these answers.

20. The form of endocytosis in which whole cells such as bacteria are brought in is:

- A. exocytosis.
- B. pinocytosis.
- C. receptor-mediated endocytosis.
- D. phagocytosis.
- E. mitosis.

21. The SNARE complex provides:

- A. recognition of foreign proteins in the cell.
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- B. They possess their own DNA.
- C. They are the site a cell respiration.
- D. Their inner membranes posses electron carriers.
- E. They possess two membranes.

23. Where do the citric acid cycle reactions occur?

- A. cytoplasm.
- B. cytosol.
- C. inner-mitochondrial membrane.
- D. outer-mitochondrial membrane.
- E. mitochondrial matrix.

24. What accounts for the most ATP production?

- A. Kreb's cycle.
- B. Citric acid cycle.
- C. NADH.
- D. electron transport and oxidative phosphorylation.
- E. glycolysis.

25. Where is CO₂ released in the aerobic cellular respiration process?

- A. glycolysis.
- B. electron transport chain.
- C. Kreb's cycle.
- D. fermentation.
- E. none of these answers.

26. Why do we need to breath in, exchange, and deliver to each cell the oxygen molecule?

- A. Glucose can't be broken down without it.
- B. It pulls electrons off the electron transport chains in the last part. of cell respiration.
- C. All chemical reactions require it.
- D. All of these answers.
- E. None of these answers.

27. What might happen if you did not get enough niacin in your diet?

- A. Glucose would not be able to be cleaved.
- B. Available FAD would decrease.
- C. When the 3-carbon chain is oxidized in glycolysis, electrons would not be able to be captured.
- D. Only fermentation would be possible
- E. All of these answers.

28. What is the carbon-based end product (chain) of glycolysis?

- A. NADH.
- B. ATP.
- C. pyruvic acid.
- D. FADH₂.
- E. CO₂.

29. Why does anaerobic respiration take place when: O₂ is not available?

- A. to continue releasing at least some energy from molecules.
- B. to continue the glycolysis processes.
- C. to generate some ATP.
- D. to regenerate the limited NAD.
- E. all of these answers.

30. Chemiosmosis:

- A. releases CO₂.
- B. extracts energy from a H⁺ concentration gradient.
- C. reduces NAD.
- D. ferments pyruvic acid to lactic acid.
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31. The electron transport chains:

- A. are "circuits" for small amounts of electricity to pass through.
- B. are made of proteins called cytochromes.
- C. deliver energy to cytochrome to pump H⁺ into the intermembrane space.
- D. are in the inner-mitochondrial membrane.
- E. all of these answers.

32. Cristae are found in the:

- A. lysosome.
- B. mitochondrion.
- C. nucleolus.
- D. nucleus.
- E. rough ER.

33. Select the incorrect association:

- A. ATP/high-energy bonds.
- B. electron transport chain/mitochondrion.
- C. glycolysis/anaerobic.
- D. glycolysis/cytosol.
- E. pyruvic acid/five-carbon molecule.

34. In an anaerobic condition:

- A. Oxygen is not present.
- B. The degradation of glucose cannot proceed beyond glycolysis.
- C. Mitochondrial processing of nutrient molecules takes place.
- D. Both (a) and (b) above.
- E. Both (a) and (c) above.

35. The universal energy currency in cells is:

- A. ATP.
- B. glucose.
- C. glycogen.
- D. insulin.
- E. myosin.

36. Which statement regarding the Citric acid cycle is incorrect?

- A. It occurs in the mitochondrial matrix.
- B. Carbon dioxide is released.
- C. Several ATP molecules are produced per turn.
- D. Acetyl CoA and oxaloacetic CoA acid initially react to form citric acid.
- E. As a molecule of GTP is formed.

37. Which molecule directly enters the citric acid cycle?

- A. acetyl CoA.
- B. adenosine diphosphate.
- C. citric acid.
- D. oxaloacetic acid.
- E. pyruvic acid.

38. The function of ATP synthase is to:

- A. act enzymatically.
- B. build membranes.
- C. carry hydrogen.
- D. synthesize ATP.
- E. transport oxygen.

39. NADH:

- A. is an energy carrier.
- B. plays a role in cellular respiration.
- C. is utilized in glycolysis.
- D. is utilized in the citric acid cycle.
- E. all of these answers.

40. The purpose of glycolysis is:

- A. to produce citric acid.
- B. to liberate energy from glucose.
- C. to produce large numbers of ATP.
- D. to trap energy in FADH₂.
- E. none of these answers.

41. The term *aerobic* means:

- A. in the blood.
- B. with carbon dioxide.
- C. with oxygen.
- D. without carbon dioxide.
- E. without oxygen.

42. Select the correct statement about vaults.

- A. They may play a role in drug resistance.
- B. Their shape resembles hexagonal barrels.
- C. They are larger than ribosomes.
- D. They are not organelles.
- E. They are visible by staining techniques.

43. Select the element that is not a part of the cytoskeleton.

- A. inclusions.
- B. intermediate filaments.
- C. microfilaments.
- D. microtubular lattice.
- E. microtubules.

44. The bending movements of cilia and flagella:

- A. are accomplished by alternate solation and gelation of the cytosol.
- B. involve the alternate assembly and disassembly of actin filaments.
- C. are produced by the sliding of adjacent microtubule doublets past each other.
- D. are important in providing motility for many organisms but are not of any use in humans.
- E. none of these answers.

45. Microtubules:

- A. serve as a mechanical stiffener for microvilli.
- B. are specialized to detect sound and positional changes in the ear.
- C. form nonmuscle contractile assemblies.
- D. play a structural role in parts of the cell subject to mechanical stress.
- E. none of these answers.

46. Which of the following organelles contains oxidative enzymes?

- A. peroxisomes.
- B. mitochondria.
- C. lysosomes.
- D. both peroxisomes and mitochondria.
- E. all of these answers.

47. Glycolysis:

- A. yields two molecules of ATP for each molecule of glucose processed.
- B. requires oxygen.
- C. takes place in the mitochondrial matrix.
- D. Both (a) and (b) above.
- E. All of these answers.

48. ATP synthase:

- A. transports hydrogen ions from the matrix to the intermembrane space of the mitochondrion.
- B. is activated by the flow of hydrogen ions from the intermembrane space to the matrix.
- C. enzymatically converts $\text{ADP} + \text{P}_i$ to ATP.
- D. Both (b) and (c) above.
- E. All of these answers.

49. Nicotinamide adenine dinucleotide (NAD):

- A. converts $\text{ADP} + \text{P}_i$ to ATP.
- B. is found in the cytosol.
- C. is a hydrogen carrier molecule.
- D. Both is found in the cytosol and is a hydrogen carrier molecule.
- E. all of these answers.

50. Which of the following is not associated with the cytosol?

- A. duplication of chromosomes.
- B. enzymatic regulation of intermediary metabolism.
- C. storage of fat and glycogen.
- D. synthesis of proteins for use in the cytosol.
- E. presence of cytoskeletal elements.

51. The function of the microtrabecular lattice is:

- A. to maintain asymmetrical cell shapes.
- B. to suspend and functionally link the largest cytoskeletal elements and organelles.
- C. to provide for cellular contractile systems.
- D. to serve as mechanical stiffeners.
- E. to serve as the chief structural units of cilia.

52. Which of the following is not characteristic of the cytoskeleton?

- A. The cytoskeleton supports the plasma membrane and is responsible for the particular shape, rigidity, and spatial geometry of each different cell type.
- B. The cytoskeleton probably plays a role in regulating cell growth and division.
- C. The cytoskeletal elements are all rigid, permanent structures.
- D. The cytoskeleton is responsible for cell contraction and cell movements.
- E. The cytoskeleton supports and organizes the ribosomes, mitochondria, and lysosomes.

53. Actin and myosin filaments are very common in _____ cells.

- A. epithelial.
- B. muscle.
- C. nerve.
- D. red blood.
- E. white blood.

54. Polyribosomes:

- A. are unusually large ribosomes.
- B. are found on smooth ER.
- C. synthesize lipids and nucleic acids.
- D. are clusters of ribosomes synthesizing the same protein.
- E. none of these answers.

55. The molecule that associates with microtubules to provide transport of secretory vesicles is:

- A. actin.
- B. actomyosin.
- C. kinesin.
- D. tubulin.
- E. xyulin.

56. Which characteristic regarding microfilaments is incorrect?

- A. They serve as mechanical stiffeners for microvilli.
- B. They are composed of actin subunits.
- C. They are the smallest elements of the cytoskeleton.
- D. They are involved in cell locomotion.
- E. They form mitotic spindles.

57. Intermediate filaments:

- A. comprised mitotic spindles.
- B. are important in cell regions subject to mechanical stress.
- C. comprise cilia.
- D. comprise flagella.
- E. form the basal bodies.

58. Electron microscopes are about 100 times more powerful than light microscopes.

True False

59. DNA's genetic code is transcribed into messenger RNA.

True False

60. The cytosol is the gel-like mass of the cytoplasm.

True False

61. DNA in the nucleus has the genetic instructions to make enzymatic proteins.

True False

62. The nucleus indirectly governs most cellular activities by directing the kinds and amounts of various enzymes and other proteins that are produced by the cell.

True False

63. The rough endoplasmic reticulum is most abundant in cells specialized for protein secretion, whereas smooth endoplasmic reticulum is abundant in cells that specialize in lipid metabolism.

True False

64. Proteins synthesized by the endoplasmic reticulum become permanently separated from the cytosol as soon as they have been synthesized.

True False

65. RER is most abundant in cells specialized for steroid production.

True False

66. The Golgi complex is functionally connected to the ER.

True False

67. The endoplasmic reticulum is one continuous organelle consisting of many tubules and cisternae.

True False

68. The lysosomes are one site of protein synthesis.

True False

69. The smooth ER specializes in protein metabolism.

True False

70. Secretory vesicles are released to the exterior of the cell by means of the process of phagocytosis.

True False

71. Secretory vesicles are about 200 times larger than transport vesicles.

True False

72. Coated vesicles enclose a representative mixture of proteins present in the Golgi sac before budding off.

True False

73. All cell organelles are renewable.

True False

74. Mitochondria are presumably descendants of primitive bacterial cells.

True False

75. Endocytosis can be accomplished by phagocytosis and pinocytosis.

True False

76. Phagocytosis is a specialized form of endocytosis used for bringing in liquids.

True False

77. The peroxisomes mainly generates hydrogen peroxide.

True False

78. Glycolysis generates ATP from glucose with high efficiency.

True False

79. ATP synthase is located in the inner mitochondrial membrane.

True False

80. Most intermediary metabolism is accomplished in the cytosol.

True False

81. Oxidative phosphorylation generates the most ATP per glucose molecule.

True False

82. Dynein is a mitochondrial enzyme.

True False

83. Cytokinesis is the division of the nucleus during mitosis.

True False

84. Amoeboid movement is accomplished by transitions of the cytosol between a gel and a sol state as a result of alternate assembly and disassembly respectively of actin filaments.

True False

85. The protective, waterproof outer layer of skin is formed by the tough skeleton of the microtrabecular lattice that persists after the surface skin cells die.

True False

86. The three major subdivisions of a cell are the _____, the _____, and the _____.

87. The fluid contained within all of the cells of the body is known collectively as _____, and the fluid outside of the cells is referred to as _____.

88. The two major parts of the cell's interior are the _____ and the _____.

89. _____ RNA carries amino acids to the sites of protein synthesis in the cell.

90. The _____ ER is the central packaging and discharge site for molecules to be transported from the ER.

91. The signal-recognition protein recognizes both the _____ on the ribosome and the _____ on the ER to deliver the proper ribosome to the proper site on the rough ER for binding.

92. Insulin is a long _____ chain.

93. The ribosomes of the rough ER synthesize _____, whereas its membranous walls contain enzymes essential for the synthesis of _____.

94. The sarcoplasmic reticulum stores the substance _____.

95. Products destined for intracellular transport are packaged in _____, whereas products for export are packaged in _____.

96. _____ refers to the process of an intracellular vesicle fusing with the plasma membrane, then opening and emptying its contents to the exterior.

97. _____ is a protein responsible for pinching off an endocytic vesicle.

98. Foreign material to be attacked by lysosomal enzymes is brought into the cell by the process of _____.

99. Lysosomes contain _____ enzymes that are capable of digesting and removing unwanted debris from the cell.

100. Lysosomes that have completed their digestive activities are known as _____.

101. _____, an enzyme found in peroxisomes, decomposes potentially toxic hydrogen peroxide.

102. ADP and P are formed from the breakdown of the molecule _____.

103. _____ refers collectively to the large set of intracellular chemical reactions that involve the degradation, synthesis, and transformation of small organic molecules.

104. The decomposition of hydrogen peroxide produces the substances _____ and _____.

105. _____ is a peroxisomal enzyme that breaks down hydrogen peroxide.

106. One glucose molecule is converted into two molecules of _____ by the end of glycolysis.

107. The metabolism of acetyl CoA into the citric acid cycle depends on the presence of _____ gas in the cell.

108. The chemiosmotic mechanism involves the transport of hydrogen across the membranes of the _____.

109. Adipose tissue stores the substance _____.

110. _____ are the dominant structural and functional components of cilia and flagella.

111. Microfilaments are comprised of the protein _____.

112. One disease caused by neurofilament abnormalities is _____.

113. A cilium or flagellum originates from the _____, a structure in the cell.

114. Match the term to its description.

- | | |
|---|---------------------|
| 1. synthesizes proteins for use in the cytosol. | Peroxisome _____ |
| 2. consists of stacks of flattened sacs. | Microtubule _____ |
| 3. removes unwanted cellular debris and foreign material. | ER _____ |
| 4. is/are one continuous extensive organelle consisting of a network of tubules and flattened filament. | Lysosome _____ |
| 5. contains powerful oxidative enzymes important in detoxifying various wastes. | Mitochondrion _____ |
| 6. acts as a mechanical stiffener. | Microfilament _____ |
| 7. is/are an important component of cilia and flagella. | Free ribosome _____ |
| 8. is/are the powerhouse of the cell. | Golgi complex _____ |
| 9. is/are shaped like an octagonal barrel. | Vault _____ |

115. Match the cellular protein with its correct characteristic.

1. comprises microtubules.

2. comprises intermediate filaments.

3. provides for transport of vesicles.

4. serve as binding sites for ribosomes.

5. causes pinching off of endocytic vesicles.

dynamain _____

ribophorin _____

actin _____

tubulin _____

kinesin _____

116. Describe the pathway that newly synthesized polypeptides take on route for secretion.

117. Describe aerobic cellular respiration from a mechanistic point of view.

118. How is ATP synthesized via electron transport and oxidative phosphorylation.

119. Describe the major aspects of the cytoskeleton.

120. Describe the structure and function of cilia and flagella.

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- A. ATP/high-energy bonds.
- B. electron transport chain/mitochondrion.
- C. glycolysis/anaerobic.
- D. glycolysis/cytosol.
- E.** pyruvic acid/five-carbon molecule.

34. In an anaerobic condition:

- A. Oxygen is not present.
- B. The degradation of glucose cannot proceed beyond glycolysis.
- C. Mitochondrial processing of nutrient molecules takes place.
- D.** Both (a) and (b) above.
- E. Both (a) and (c) above.

35. The universal energy currency in cells is:

- A.** ATP.
- B. glucose.
- C. glycogen.
- D. insulin.
- E. myosin.

36. Which statement regarding the Citric acid cycle is incorrect?

- A. It occurs in the mitochondrial matrix.
- B. Carbon dioxide is released.
- C.** Several ATP molecules are produced per turn.
- D. Acetyl CoA and oxaloacetic CoA acid initially react to form citric acid.
- E. As a molecule of GTP is formed.

37. Which molecule directly enters the citric acid cycle?

- A.** acetyl CoA.
- B. adenosine diphosphate.
- C. citric acid.
- D. oxaloacetic acid.
- E. pyruvic acid.

38. The function of ATP synthase is to:

- A. act enzymatically.
- B. build membranes.
- C. carry hydrogen.
- D.** synthesize ATP.
- E. transport oxygen.

39. NADH:

- A.** is an energy carrier.
- B. plays a role in cellular respiration.
- C. is utilized in glycolysis.
- D. is utilized in the citric acid cycle.
- E. all of these answers.

40. The purpose of glycolysis is:

- A. to produce citric acid.
- B.** to liberate energy from glucose.
- C. to produce large numbers of ATP.
- D. to trap energy in FADH₂.
- E. none of these answers.

41. The term *aerobic* means:

- A. in the blood.
- B. with carbon dioxide.
- C.** with oxygen.
- D. without carbon dioxide.
- E. without oxygen.

42. Select the correct statement about vaults.

- A. They may play a role in drug resistance.
- B. Their shape resembles hexagonal barrels.
- C.** They are larger than ribosomes.
- D. They are not organelles.
- E. They are visible by staining techniques.

43. Select the element that is not a part of the cytoskeleton.

- A.** inclusions.
- B. intermediate filaments.
- C. microfilaments.
- D. microtubular lattice.
- E. microtubules.

44. The bending movements of cilia and flagella:

- A. are accomplished by alternate solation and gelation of the cytosol.
- B. involve the alternate assembly and disassembly of actin filaments.
- C.** are produced by the sliding of adjacent microtubule doublets past each other.
- D. are important in providing motility for many organisms but are not of any use in humans.
- E. none of these answers.

45. Microtubules:

- A. serve as a mechanical stiffener for microvilli.
- B. are specialized to detect sound and positional changes in the ear.
- C. form nonmuscle contractile assemblies.
- D. play a structural role in parts of the cell subject to mechanical stress.
- E.** none of these answers.

46. Which of the following organelles contains oxidative enzymes?

- A. peroxisomes.
- B. mitochondria.
- C. lysosomes.
- D.** both peroxisomes and mitochondria.
- E. all of these answers.

47. Glycolysis:

- A.** yields two molecules of ATP for each molecule of glucose processed.
- B. requires oxygen.
- C. takes place in the mitochondrial matrix.
- D. Both (a) and (b) above.
- E. All of these answers.

48. ATP synthase:

- A. transports hydrogen ions from the matrix to the intermembrane space of the mitochondrion.
- B. is activated by the flow of hydrogen ions from the intermembrane space to the matrix.
- C. enzymatically converts $\text{ADP} + \text{P}_i$ to ATP.
- D.** Both (b) and (c) above.
- E. All of these answers.

49. Nicotinamide adenine dinucleotide (NAD):

- A. converts $\text{ADP} + \text{P}_i$ to ATP.
- B. is found in the cytosol.
- C.** is a hydrogen carrier molecule.
- D. Both is found in the cytosol and is a hydrogen carrier molecule.
- E. all of these answers.

50. Which of the following is not associated with the cytosol?

- A.** duplication of chromosomes.
- B. enzymatic regulation of intermediary metabolism.
- C. storage of fat and glycogen.
- D. synthesis of proteins for use in the cytosol.
- E. presence of cytoskeletal elements.

51. The function of the microtrabecular lattice is:

- A. to maintain asymmetrical cell shapes.
- B.** to suspend and functionally link the largest cytoskeletal elements and organelles.
- C. to provide for cellular contractile systems.
- D. to serve as mechanical stiffeners.
- E. to serve as the chief structural units of cilia.

52. Which of the following is not characteristic of the cytoskeleton?

- A. The cytoskeleton supports the plasma membrane and is responsible for the particular shape, rigidity, and spatial geometry of each different cell type.
- B. The cytoskeleton probably plays a role in regulating cell growth and division.
- C.** The cytoskeletal elements are all rigid, permanent structures.
- D. The cytoskeleton is responsible for cell contraction and cell movements.
- E. The cytoskeleton supports and organizes the ribosomes, mitochondria, and lysosomes.

53. Actin and myosin filaments are very common in _____ cells.

- A. epithelial.
- B.** muscle.
- C. nerve.
- D. red blood.
- E. white blood.

54. Polyribosomes:

- A. are unusually large ribosomes.
- B. are found on smooth ER.
- C. synthesize lipids and nucleic acids.
- D.** are clusters of ribosomes synthesizing the same protein.
- E. none of these answers.

55. The molecule that associates with microtubules to provide transport of secretory vesicles is:

- A. actin.
- B. actomyosin.
- C. kinesin.**
- D. tubulin.
- E. xyulin.

56. Which characteristic regarding microfilaments is incorrect?

- A. They serve as mechanical stiffeners for microvilli.
- B. They are composed of actin subunits.
- C. They are the smallest elements of the cytoskeleton.
- D. They are involved in cell locomotion.
- E. They form mitotic spindles.**

57. Intermediate filaments:

- A. comprised mitotic spindles.
- B. are important in cell regions subject to mechanical stress.**
- C. comprise cilia.
- D. comprise flagella.
- E. form the basal bodies.

58. Electron microscopes are about 100 times more powerful than light microscopes.

TRUE

59. DNA's genetic code is transcribed into messenger RNA.

TRUE

60. The cytosol is the gel-like mass of the cytoplasm.

TRUE

61. DNA in the nucleus has the genetic instructions to make enzymatic proteins.

TRUE

62. The nucleus indirectly governs most cellular activities by directing the kinds and amounts of various enzymes and other proteins that are produced by the cell.

TRUE

63. The rough endoplasmic reticulum is most abundant in cells specialized for protein secretion, whereas smooth endoplasmic reticulum is abundant in cells that specialize in lipid metabolism.

TRUE

64. Proteins synthesized by the endoplasmic reticulum become permanently separated from the cytosol as soon as they have been synthesized.

TRUE

65. RER is most abundant in cells specialized for steroid production.

FALSE

66. The Golgi complex is functionally connected to the ER.

TRUE

67. The endoplasmic reticulum is one continuous organelle consisting of many tubules and cisternae.

TRUE

68. The lysosomes are one site of protein synthesis.

FALSE

69. The smooth ER specializes in protein metabolism.

FALSE

70. Secretory vesicles are released to the exterior of the cell by means of the process of phagocytosis.

FALSE

71. Secretory vesicles are about 200 times larger than transport vesicles.

TRUE

72. Coated vesicles enclose a representative mixture of proteins present in the Golgi sac before budding off.

FALSE

73. All cell organelles are renewable.

TRUE

74. Mitochondria are presumably descendants of primitive bacterial cells.

TRUE

75. Endocytosis can be accomplished by phagocytosis and pinocytosis.

TRUE

76. Phagocytosis is a specialized form of endocytosis used for bringing in liquids.

FALSE

77. The peroxisomes mainly generates hydrogen peroxide.

TRUE

78. Glycolysis generates ATP from glucose with high efficiency.

FALSE

79. ATP synthase is located in the inner mitochondrial membrane.

TRUE

80. Most intermediary metabolism is accomplished in the cytosol.

TRUE

81. Oxidative phosphorylation generates the most ATP per glucose molecule.

TRUE

82. Dynein is a mitochondrial enzyme.

FALSE

83. Cytokinesis is the division of the nucleus during mitosis.

FALSE

84. Amoeboid movement is accomplished by transitions of the cytosol between a gel and a sol state as a result of alternate assembly and disassembly respectively of actin filaments.

TRUE

85. The protective, waterproof outer layer of skin is formed by the tough skeleton of the microtrabecular lattice that persists after the surface skin cells die.

FALSE

86. The three major subdivisions of a cell are the _____, the _____, and the _____.

plasma membrane, nucleus, cytoplasm

87. The fluid contained within all of the cells of the body is known collectively as _____, and the fluid outside of the cells is referred to as _____.

intracellular fluid, extracellular fluid

88. The two major parts of the cell's interior are the _____ and the _____.

nucleus, cytoplasm *or*

cytoplasm, nucleus

89. _____ RNA carries amino acids to the sites of protein synthesis in the cell.

messenger

90. The _____ ER is the central packaging and discharge site for molecules to be transported from the ER.

smooth

91. The signal-recognition protein recognizes both the _____ on the ribosome and the _____ on the ER to deliver the proper ribosome to the proper site on the rough ER for binding.

leader sequence, ribophorin

92. Insulin is a long _____ chain.

polypeptide

93. The ribosomes of the rough ER synthesize _____, whereas its membranous walls contain enzymes essential for the synthesis of _____.

proteins, lipids

94. The sarcoplasmic reticulum stores the substance _____.

calcium

95. Products destined for intracellular transport are packaged in _____, whereas products for export are packaged in _____.

coated vesicles, secretory vesicles

96. _____ refers to the process of an intracellular vesicle fusing with the plasma membrane, then opening and emptying its contents to the exterior.

exocytosis

97. _____ is a protein responsible for pinching off an endocytic vesicle.

dynamain

98. Foreign material to be attacked by lysosomal enzymes is brought into the cell by the process of _____.

endocytosis

99. Lysosomes contain _____ enzymes that are capable of digesting and removing unwanted debris from the cell.

hydrolytic

100. Lysosomes that have completed their digestive activities are known as _____.

residual bodies

101. _____, an enzyme found in peroxisomes, decomposes potentially toxic hydrogen peroxide.

catalase

102. ADP and P are formed from the breakdown of the molecule _____.

adenosine triphosphate *or*

ATP

103. _____ refers collectively to the large set of intracellular chemical reactions that involve the degradation, synthesis, and transformation of small organic molecules.

intermediary metabolism

104. The decomposition of hydrogen peroxide produces the substances _____ and _____.

water, oxygen *or*

oxygen, water

105. _____ is a peroxisomal enzyme that breaks down hydrogen peroxide.

catalase

106. One glucose molecule is converted into two molecules of _____ by the end of glycolysis.

pyruvic acid

107. The metabolism of acetyl CoA into the citric acid cycle depends on the presence of _____ gas in the cell.

oxygen

108. The chemiosmotic mechanism involves the transport of hydrogen across the membranes of the _____.

mitochondrion

109. Adipose tissue stores the substance _____.

fat

110. _____ are the dominant structural and functional components of cilia and flagella.

microtubules

111. Microfilaments are comprised of the protein _____.

actin

112. One disease caused by neurofilament abnormalities is _____.

amyotrophic lateral sclerosis.

113. A cilium or flagellum originates from the _____, a structure in the cell.

basal body

114. Match the term to its description.

1. synthesizes proteins for use in the cytosol.

2. consists of stacks of flattened sacs.

3. removes unwanted cellular debris and foreign material.

4. is/are one continuous extensive organelle consisting of a network of tubules and flattened filament.

5. contains powerful oxidative enzymes important in detoxifying various wastes.

6. acts as a mechanical stiffener.

7. is/are an important component of cilia and flagella.

8. is/are the powerhouse of the cell.

9. is/are shaped like an octagonal barrel.

Peroxisome 5

Microtubule 7

ER 4

Lysosome 3

Mitochondrion 8

Microfilament 6

Free ribosome 1

Golgi complex 2

Vault 9

115. Match the cellular protein with its correct characteristic.

- | | | |
|---|------------|----------|
| 1. comprises microtubules. | dynamain | <u>5</u> |
| 2. comprises intermediate filaments. | ribophorin | <u>4</u> |
| 3. provides for transport of vesicles. | actin | <u>2</u> |
| 4. serve as binding sites for ribosomes. | tubulin | <u>1</u> |
| 5. causes pinching off of endocytic vesicles. | kinesin | <u>3</u> |

116. Describe the pathway that newly synthesized polypeptides take on route for secretion.

Answer not provided.

117. Describe aerobic cellular respiration from a mechanistic point of view.

Answer not provided.

118. How is ATP synthesized via electron transport and oxidative phosphorylation.

Answer not provided.

119. Describe the major aspects of the cytoskeleton.

Answer not provided.

120. Describe the structure and function of cilia and flagella.

Answer not provided.