Chapter 02
Cytology-The Study of Cells

Multiple Choice Questions

1. Cells of the small intestine and kidney tubule have a "brush border" composed of _____, which are cell extensions that increase surface area.
A. cilia
B. cholesterol in the plasma membrane
C. flagella
D. rugae
E. microvilli

Bloom's Level: 2. Understand
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.2d Describe the structure and function of microvilli, cilia, flagella, and cell junctions.
Section: 2.02
Topic: Cells

2. Which microscope type would be most useful if a person wanted to see details of the structure of organelles in the cell?
A. Transmission electron microscope
B. Scanning electron microscope
C. Light microscope
D. Fluorescence microscope
E. Compound microscope

Bloom's Level: 2. Understand
Learning Outcome: 2.1b Discuss the way that developments in microscopy have changed our view of cell structure.
Section: 2.01
Topic: Cells

3. What term would you use to describe a cell whose shape is thin, flat, and scaly, such as those found on the surface layer (epidermis) of the skin?
A. Columnar
B. Cuboidal
C. Squamous
D. Fusiform
E. Stellate

Bloom's Level: 1. Remember
Learning Outcome: 2.1d Identify cell shapes from their descriptive terms.
Section: 2.01
Topic: Cells

4. How does the relationship between surface area and volume impact how large a cell can be?
A. Volume is proportional to the cube of the diameter of the cell, so if diameter increases, volume will increase much faster than surface area, limiting exchange of wastes and nutrients.
B. Volume and surface area both increase the same amount if the diameter of the cell increases.
C. Surface area increases proportionately more than volume as the diameter of the cell increases and, therefore, exchange of wastes and nutrients is more efficient in a large cell.
D. If the diameter of the cell doubles, the volume of the cell will increase by a factor of four.
E. If the diameter of the cell doubles, the volume of the cell will also double.

Bloom's Level: 3. Apply
Learning Outcome: 2.1e State the size range of human cells and explain why cell size is limited.
Section: 2.01
Topic: Cells

5. The genetically unique carbohydrate coat that enables the cell to identify "self " from "non-self " is the _____.
A. cytoskeleton
B. plasma membrane
C. glycocalyx
D. basement membrane
E. serosa

Bloom's Level: 1. Remember
HAPS Objective: C07.02 Describe how carbohydrates are distributed in a cell membrane, and explain their functions.
HAPS Topic: Module C07 Membrane structure and function.
Learning Outcome: 2.2b Explain the functions of the lipid, protein, and carbohydrate components of the plasma membrane.
Section: 2.02
Topic: Cells

6. Which process would be stopped if a poison interfered with ATP production?
A. Simple diffusion
B. Osmosis
C. Filtration
D. Active transport
E. Facilitated diffusion

Bloom's Level: 3. Apply
HAPS Objective: C08.01c Discuss the energy requirements and, if applicable, the sources of energy for each process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

7. Which statement concerning transmembrane proteins in the plasma membrane is false?
A. They extend all the way through the plasma membrane.
B. Some have carbohydrate chains and help form the glycocalyx.
C. They are more abundant than the phospholipids.
D. They may serve as channels that allow certain solutes to enter and leave the cell.
E. They may be carriers that transport substances from one side of the plasma membrane to the other.

Bloom's Level: 2. Understand
HAPS Objective: C07.03 Describe how proteins are distributed in a cell membrane, and explain their functions.
HAPS Topic: Module C07 Membrane structure and function.
Learning Outcome: 2.2b Explain the functions of the lipid, protein, and carbohydrate components of the plasma membrane.
Section: 2.02
Topic: Cells

8. Which of the following is NOT true of phospholipids?
A. They consist of a phosphate-containing head and two fatty acid tails.
B. They comprise the majority of lipids in the plasma membrane.
C. The fatty acid tails are hydrophilic.
D. The phosphate-containing heads are hydrophilic.
E. The heads of the phospholipids face towards the extracellular fluid.

Bloom's Level: 2. Understand
HAPS Objective: C07.01 Describe how lipids are distributed in a cell membrane, and explain their functions.
HAPS Topic: Module C07 Membrane structure and function.
Learning Outcome: 2.2a Describe the structure of the plasma membrane.
Section: 2.02
Topic: Cells

9. Which molecules form the basis for the lipid bilayer structure of the plasma membrane?
A. Cholesterol
B. Glycolipids
C. Transmembrane proteins
D. Phospholipids
E. Glycoproteins

Bloom's Level: 1. Remember
HAPS Objective: C07.01 Describe how lipids are distributed in a cell membrane, and explain their functions.
HAPS Topic: Module C07 Membrane structure and function.
Learning Outcome: 2.2a Describe the structure of the plasma membrane.
Section: 2.02
Topic: Cells

10. White blood cells engulf bacteria by means of
A. phagocytosis.
B. pinocytosis.
C. active transport.
D. facilitated diffusion.
E. exocytosis.

Bloom's Level: 1. Remember
HAPS Objective: C08.01a State the type of material moving in each of the membrane transport process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

11. How would you characterize the sodium-potassium (Na^+--K^+) pump?
A. Vesicular transport
B. Phagocytosis
C. Active transport
D. Facilitated diffusion
E. Receptor-mediated endocytosis

Bloom's Level: 2. Understand
HAPS Objective: C08.01d Give examples of each membrane transport process in the human body – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

12. Which structure is enclosed in two membranes with cristae extending inward from the inner membrane?
A. Endoplasmic reticulum
B. Nucleus
C. Lysosome
D. Golgi complex
E. Mitochondria

Bloom's Level: 1. Remember
HAPS Objective: C09.02b Describe the structure of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

13. Specialized pancreatic cells produce insulin. How do you think the cells would secrete this product so that it can be used throughout the body?
A. Phagocytosis
B. Pinocytosis
C. Endocytosis
D. Exocytosis
E. Osmosis

Bloom's Level: 3. Apply
HAPS Objective: C08.01d Give examples of each membrane transport process in the human body – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.03
Topic: Cells

14. In the cell cycle, DNA is replicated during
A. G1.
B. G2.
C. S phase.
D. anaphase.
E. telophase.

Bloom's Level: 1. Remember
HAPS Objective: C12.01a Describe the events that take place in each stage of generalized cell cycle, including interphase and the stages of mitosis.
HAPS Topic: Module C12 Somatic cell division.
Learning Outcome: 2.4a Describe the life cycle of a cell.
Section: 2.04
Topic: Cells

15. During mitosis, the mitotic spindle serves to
A. separate the chromatids at the centromere.
B. pull together the replicated chromosomal strands.
C. re-form the nuclear envelope.
D. separate the cytoplasm to the new daughter cells.
E. separate the two halves of the DNA double helix.

Bloom's Level: 1. Remember
HAPS Objective: C12.01a Describe the events that take place in each stage of generalized cell cycle, including interphase and the stages of mitosis.
HAPS Topic: Module C12 Somatic cell division.
Learning Outcome: 2.4b Name the stages of mitosis and describe the events that occur in each one.
Section: 2.04
Topic: Cells

16. Which structure contains an axoneme?
A. Brush border
B. Microvilli
C. Intermediate filament
D. Cilia
E. Desmosome

Bloom's Level: 1. Remember
HAPS Objective: C09.02b Describe the structure of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.2d Describe the structure and function of microvilli, cilia, flagella, and cell junctions.
Section: 2.02
Topic: Cells

17. The modern cell theory includes all of the following generalizations except
A. the cell is the smallest unit of life.
B. all cells arise from other cells.
C. all cells are enclosed in a cell wall.
D. the cells of all species are fundamentally similar in that they all have DNA as the hereditary material.
E. all functions of the body result from cellular activity.

Bloom's Level: 1. Remember
Learning Outcome: 2.1a State some tenets of the cell theory.
Section: 2.01
Topic: Cells

18. Which measurement seems most logical if one is describing the size of a cell?
A. 1-2 mm
B. 10 um
C. 2 mm
D. 5-10 nm
E. 1 nm

Bloom's Level: 3. Apply
Learning Outcome: 2.1e State the size range of human cells and explain why cell size is limited.
Section: 2.01
Topic: Cells

19. Materials that are to be discharged by cells through the process of exocytosis are packaged by the
A. lysosomes.
B. endoplasmic reticulum.
C. mitochondria.
D. ribosomes.
E. Golgi complex.

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

20. Which of the following is the location where chains of amino acids are assembled in the order prescribed by the DNA?
A. Endoplasmic reticulum
B. Ribosomes
C. Nucleus
D. Golgi complex
E. Mitochondria

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

21. Which of the following has a flagellum?
A. Cells lining the respiratory tract
B. Sperm
C. Cells specialized for absorption, such as epithelial cells of the small intestine
D. Cells lining the uterine tube
E. Neurons

Bloom's Level: 1. Remember
HAPS Objective: C09.02a each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

22. In the plasma membrane of the cell, cholesterol acts to
A. maintain stability of the plasma membrane.
B. make the membrane more resistant to freezing.
C. form receptor molecules.
D. increase the fluidity of the membrane.
E. restrict the entry of most molecules.

Bloom's Level: 1. Remember
HAPS Objective: C07.01 Describe how lipids are distributed in a cell membrane, and explain their functions.
HAPS Topic: Module C07 Membrane structure and function.
Learning Outcome: 2.2b Explain the functions of the lipid, protein, and carbohydrate components of the plasma membrane.
Section: 2.02
Topic: Cells

23. The second most abundant lipid molecule in the plasma membrane is
A. phospholipid.
B. glycolipid.
C. saturated fat.
D. cholesterol.
E. olive oil.

Bloom's Level: 1. Remember
HAPS Objective: C07.01 Describe how lipids are distributed in a cell membrane, and explain their functions.
HAPS Topic: Module C07 Membrane structure and function.
Learning Outcome: 2.2b Explain the functions of the lipid, protein, and carbohydrate components of the plasma membrane.
Section: 2.02
Topic: Cells

24. The glycocalyx serves the following functions except
A. distinguishing the body's own cells from foreign cells.
B. protecting the membrane from physical and chemical injury.
C. determining blood transfusion compatibility.
D. helping to bind a sperm to an egg.
E. absorbing energy into the cell.

Bloom's Level: 1. Remember
HAPS Objective: C07.02 Describe how carbohydrates are distributed in a cell membrane, and explain their functions.
HAPS Topic: Module C07 Membrane structure and function.
Learning Outcome: 2.2b Explain the functions of the lipid, protein, and carbohydrate components of the plasma membrane.
Section: 2.02
Topic: Cells

25. An individual with widespread blistering of the skin and oral mucosa due to a misguided attack by autoantibodies probably suffers from
A. diabetes.
B. multiple sclerosis.
C. situs inversus.
D. pemphigus vulgaris.
E. a neoplasm.

Bloom's Level: 2. Understand
HAPS Objective: C15.02 Predict the types of problems that would occur if the cells could not maintain homeostasis due to abnormalities in organelle function, transport processes, protein synthesis, or the cell cycle.
HAPS Topic: Module C15 Predictions related to homeostatic imbalance, including disease states and disorders.
Learning Outcome: 2.2d Describe the structure and function of microvilli, cilia, flagella, and cell junctions.
Section: 2.02
Topic: Cells

26. Microfilaments of the cytoskeleton are composed of
A. keratin.
B. cholesterol.
C. actin.
D. glycoproteins.
E. phospholipids.

Bloom's Level: 1. Remember
HAPS Objective: C06.01 Identify the three main parts of a cell, and list the general functions of each.
HAPS Topic: Module C06 Intracellular organization of nucleus and cytoplasm.
Learning Outcome: 2.3a Describe the cytoskeleton and its functions.
Section: 2.03
Topic: Cells

27. Which function is associated with the rough endoplasmic reticulum?
A. ATP synthesis
B. Protein synthesis
C. DNA synthesis
D. Active transport
E. Polysaccharide hydrolysis

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

28. Which organelle is most active in apoptosis (programmed cell death)?
A. Mitochondria
B. Endoplasmic reticulum
C. Lysosomes
D. Nucleus

Bloom's Level: 2. Understand
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

29. Muscle cells contain numerous_____ because of their high demand for ATP.
A. mitochondria
B. endoplasmic reticulum
C. lysosomes
D. nucleus
E. Golgi complexes

Bloom's Level: 2. Understand
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

30. All of the following processes move substances out of a cell except
A. exocytosis
B. phagocytosis.
C. active transport.
D. simple diffusion.
E. facilitated diffusion.

Bloom's Level: 2. Understand
HAPS Objective: C08.01b Describe the mechanism by which movement of material occurs in each membrane transport process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

31. Some of the peripheral microtubules of a cilium continue into the cell as a short
A. basal body.
B. terminal web.
C. microfilament.
D. axoneme.
E. centrosome.

Bloom's Level: 2. Understand
HAPS Objective: C09.02b Describe the structure of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.2d Describe the structure and function of microvilli, cilia, flagella, and cell junctions.
Section: 2.02
Topic: Cells

32. Why is the nucleus considered to be the control center of cellular activity?
A. It contains DNA.
B. It has nuclear pores.
C. It contains ribosomes.
D. It has a nuclear envelope.
E. It has a nucleolus.

Bloom's Level: 2. Understand
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

33. Lysosomes originate from
A. the Golgi complex.
B. the plasma membrane.
C. the nucleus.
D. phospholipid molecules.
E. smooth endoplasmic reticulum.

Bloom's Level: 1. Remember
HAPS Objective: C09.02a each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

34. Which of the following is an inclusion, not an organelle?
A. The Golgi complex
B. Lysosomes
C. Microtubule
D. Glycogen
E. Mitochondrion

Bloom's Level: 2. Understand
Learning Outcome: 2.3c Give some examples of cell inclusions and explain how inclusions differ from organelles.
Section: 2.03
Topic: Cells

35. Which of the following is true of tight junctions?
A. They are formed by connexons.
B. They seal off intercellular space and prevent substances from passing between cells.
C. They contain channels of diffusion of solutes from one cell to the next.
D. They are patches that are formed when J-shaped proteins protrude toward the plasma membrane from the cytoskeleton.
E. They are patch-like connections that are abundant in the epidermis and serve to keep cells from pulling apart.

Bloom's Level: 2. Understand
Learning Outcome: 2.2d Describe the structure and function of microvilli, cilia, flagella, and cell junctions.
Section: 2.02
Topic: Cells

36. Which type of intercellular connection facilitates passage of electrical signals between cardiocytes and enables a coordinated heart beat?
A. Tight junctions
B. Desmosomes
C. Gap junctions
D. Tuxedo junctions
E. J junctions

Bloom's Level: 1. Remember
Learning Outcome: 2.2d Describe the structure and function of microvilli, cilia, flagella, and cell junctions.
Section: 2.02
Topic: Cells

37. Which of the following has its own DNA independent of nuclear DNA?
A. Golgi complex
B. Lysosomes
C. Ribosomes
D. Peroxisomes
E. Mitochondria

Bloom's Level: 1. Remember
HAPS Objective: C09.02b Describe the structure of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

38. Functions of the Golgi complex include all of the following except
A. synthesis of carbohydrates.
B. synthesis of lysosomes.
C. packaging of proteins for export from the cell.
D. DNA replication.
E. adding carbohydrates to certain proteins.

Bloom's Level: 2. Understand
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

39. Which of the following is not an element of the cytoskeleton?
A. Microfilaments
B. Microtubules
C. Actin
D. Intermediate filaments
E. Cilia

Bloom's Level: 2. Understand
HAPS Objective: C06.01 Identify the three main parts of a cell, and list the general functions of each.
HAPS Topic: Module C06 Intracellular organization of nucleus and cytoplasm.
Learning Outcome: 2.3a Describe the cytoskeleton and its functions.
Section: 2.03
Topic: Cells

40. The transmission electron microscope can magnify images up to how many times?
A. 200
B. 1,200
C. 300,000
D. 600,000
E. 1,000,000

Bloom's Level: 1. Remember
Learning Outcome: 2.1b Discuss the way that developments in microscopy have changed our view of cell structure.
Section: 2.01
Topic: Cells

41. Peroxisomes function to
A. produce ATP.
B. package vesicles.
C. break down proteins and phospholipids.
D. detoxify various drugs in the liver.
E. synthesize lipids.

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

42. Where in the body would you expect to find cells that have an abundance of smooth endoplasmic reticulum?
A. The ovaries
B. The brain
C. The lining of the stomach
D. The surface of the skin
E. The bone marrow

Bloom's Level: 3. Apply
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

43. In mitosis, which structure anchors microtubules originating from the centriole to the centromere of a chromosome?
A. Spindle fiber
B. Kinetochore
C. Chromatid
D. Aster
E. Mitotic spindle

Bloom's Level: 1. Remember
HAPS Objective: C12.01a Describe the events that take place in each stage of generalized cell cycle, including interphase and the stages of mitosis.
HAPS Topic: Module C12 Somatic cell division.
Learning Outcome: 2.4b Name the stages of mitosis and describe the events that occur in each one.
Section: 2.04
Topic: Cells

44. The endocytotic process by which tiny packets of fluid are brought into the cell is called
A. facilitated diffusion.
B. osmosis.
C. pinocytosis.
D. phagocytosis.
E. exocytosis.

Bloom's Level: 1. Remember
HAPS Objective: C08.01b Describe the mechanism by which movement of material occurs in each membrane transport process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

45. Which of the following would not be affected by the absence of microtubules?
A. Cell division
B. Cell movement
C. The arrangement of organelles
D. DNA replication
E. Movement of molecules within the cell

Bloom's Level: 3. Apply
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3a Describe the cytoskeleton and its functions.
Section: 2.03
Section: 2.04
Topic: Cells

46. Separation of the cytoplasm during cell division is called
A. telophase.
B. anaphase.
C. metaphase.
D. cytokinesis.
E. mitosis.

Bloom's Level: 1. Remember
HAPS Objective: C12.02 Distinguish between mitosis and cytokinesis.
HAPS Topic: Module C12 Somatic cell division.
Learning Outcome: 2.4a Describe the life cycle of a cell.
Section: 2.04
Topic: Cells

47. What are pluripotent stem cells?
A. Cells that are able to develop only into one mature cell type.
B. Cells found only in the bone marrow that can differentiate into any kind of blood cell.
C. Cells found only in adult tissue that replace cells that have died or become damaged.
D. Cells from pre-embryos that can develop into any type of embryonic or adult cell.
E. Very strong cells that can assume the function of any cell type in the body.

Bloom's Level: 1. Remember
Learning Outcome: 2.4c Discuss the types and clinical uses of stem cells.
Section: 2.04
Topic: Cells

48. Which of the following is a clear gel, with no visible structure of its own, in which the organelles are embedded?
A. Nucleoplasm
B. Cytoplasm
C. Cytosol
D. Ectoplasm
E. Protoplasm

Bloom's Level: 1. Remember
HAPS Objective: C06.02 Explain how cytoplasm and cytosol are different.
HAPS Topic: Module C06 Intracellular organization of nucleus and cytoplasm.
Learning Outcome: 2.1c Outline the major structural components of a cell.
Section: 2.03
Topic: Cells

49. What function would immediately stop if the ribosomes were destroyed?
A. ATP synthesis
B. DNA replication
C. Protein synthesis
D. Osmosis
E. Active transport

Bloom's Level: 3. Apply
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

50. Which is true of inclusions?
A. They are enclosed in a unit membrane.
B. They are essential for cell survival.
C. An example of an inclusion is a mitochondrion.
D. They are never enclosed in a unit membrane.
E. They are one component of the cytoskeleton.

Bloom's Level: 2. Understand
Learning Outcome: 2.3c Give some examples of cell inclusions and explain how inclusions differ from organelles.
Section: 2.03
Topic: Cells

Essay Questions

51. The portion of the cell cycle where proteins are synthesized, growth occurs, and regular cellular tasks are carried out is the _____.

first gap (G_1) phase

Bloom's Level: 1. Remember
HAPS Objective: C12.01a Describe the events that take place in each stage of generalized cell cycle, including interphase and the stages of mitosis.
HAPS Topic: Module C12 Somatic cell division.
Learning Outcome: 2.4a Describe the life cycle of a cell.
Section: 2.04
Topic: Cells

Fill in the Blank Questions

52. The organelle that synthesizes carbohydrates, sorts and packages proteins, and synthesizes lysosomes is the _____ _____.
Golgi Complex

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

53. The site of production of most of the ATP in the cell is the _____.
mitochondria

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

54. The _____ _____ _____ is studded with ribosomes and plays a role in protein synthesis.
rough endoplasmic reticulum

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

55. A structure that synthesizes steroid hormones and is abundant in the ovaries and testes is the _____ _____ _____.
smooth endoplasmic reticulum

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

56. Membrane-enclosed packets of enzymes that play a role in apoptosis are _____.
lysosomes.

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

57. The _____ play a role in neutralizing free radicals, detoxifying alcohol and other drugs, and break fatty acids into 2-carbon molecules.
peroxisomes

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

58. Components of the cytoskeleton composed mainly of the protein actin are _____.
microfilaments

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3a Describe the cytoskeleton and its functions.
Section: 2.03
Topic: Cells

59. Amino acid chains are assembled in accordance with instructions contained in DNA at the _____.
ribosome

Bloom's Level: 2. Understand
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

60. A process by which particles move from high concentration to low concentration is _____.
diffusion

Bloom's Level: 1. Remember
HAPS Objective: C08.01b Describe the mechanism by which movement of material occurs in each membrane transport process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

61. A process where pressure forces material through a membrane is _____.
filtration

Bloom's Level: 1. Remember
HAPS Objective: C08.01b Describe the mechanism by which movement of material occurs in each membrane transport process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

62. The diffusion of water through a semi-permeable membrane is called _____.
osmosis

Bloom's Level: 1. Remember
HAPS Objective: C08.01b Describe the mechanism by which movement of material occurs in each membrane transport process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

63. _____ _____ is a process that does not require cellular energy where carrier proteins ferry substances down their concentration gradient.
Facilitated diffusion

Bloom's Level: 1. Remember
HAPS Objective: C08.01b Describe the mechanism by which movement of material occurs in each membrane transport process – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

64. _____ is the part of the cell cycle when the chromatids are pulled to opposite sides of the cell.
Anaphase

Bloom's Level: 1. Remember
HAPS Objective: C12.01a Describe the events that take place in each stage of generalized cell cycle, including interphase and the stages of mitosis.
HAPS Topic: Module C12 Somatic cell division.
Learning Outcome: 2.4b Name the stages of mitosis and describe the events that occur in each one.
Section: 2.04
Topic: Cells

65. A mass of tissue produced when the rate of cell division exceed the rate of cell death is a _____.
tumor or neoplasm

Bloom's Level: 1. Remember
HAPS Objective: C15.02 Predict the types of problems that would occur if the cells could not maintain homeostasis due to abnormalities in organelle function, transport processes, protein synthesis, or the cell cycle.
HAPS Topic: Module C15 Predictions related to homeostatic imbalance, including disease states and disorders.
Learning Outcome: 2.4a Describe the life cycle of a cell.
Section: 2.04
Topic: Cells

66. Embryonic stem cells are _____. That is, they have the ability to develop into any type of adult cell.
pluripotent

Bloom's Level: 1. Remember
Learning Outcome: 2.4c Discuss the types and clinical uses of stem cells.
Section: 2.04
Topic: Cells

67. The study of cellular structure and function is _____.
cytology

Bloom's Level: 1. Remember
Learning Outcome: 2.1a State some tenets of the cell theory.
Section: 2.01
Topic: Cells

68. White blood cells engulf bacteria through the process of _____.
phagocytosis

Bloom's Level: 2. Understand
HAPS Objective: C08.01d Give examples of each membrane transport process in the human body – simple diffusion, facilitated diffusion, osmosis, active transport, exocytosis, endocytosis, phagocytosis, pinocytosis, and filtration.
HAPS Topic: Module C08 Mechanisms for movement of materials across cell membranes.
Learning Outcome: 2.2c Describe the processes for moving material into and out of a cell.
Section: 2.02
Topic: Cells

69. Extensions of the plasma membrane that increase surface area for absorption of nutrients in the small intestine are _____.
microvilli

Bloom's Level: 2. Understand
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.2d Describe the structure and function of microvilli, cilia, flagella, and cell junctions.
Section: 2.02
Topic: Cells

70. Organelles that have their own DNA are _____.
mitochondria

Bloom's Level: 1. Remember
HAPS Objective: C09.02c Describe the function of each different type of organelle associated with human cells.
HAPS Topic: Module C09 Organelles.
Learning Outcome: 2.3b List the main organelles of a cell and explain their functions.
Section: 2.03
Topic: Cells

Check All That Apply Questions

71. Select all that are basic components of the cell.
__X__ Plasma membrane
__X__ Cytoplasm
_____ Nucleus
__X__ Nucleoplasm

The plasma membrane, cytoplasm, and nuceloplasm are the three basic components of a cell. The nucleus is classified as an organelle.

Bloom's Level: 1. Remember
Learning Outcome: 2.1c Outline the major structural components of a cell.
Section: 2.01
Topic: Cells

Multiple Choice Questions

72. Skeletal muscle cells are long and slender. Therefore, they would be considered _____ in shape.
A. squamous
B. discoid
C. fibrous
D. cuboidal

Bloom's Level: 3. Apply
Learning Outcome: 2.1d Identify cell shapes from their descriptive terms.
Section: 2.01
Topic: Cells