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Test Generator Questions, Chapter 2, Altered Cells and Tissues

1. Which term indicates a fully differentiated body part with specialized functions?
   A. Cell
   B. Organ
   C. Tissue
   D. Organ system

Answer: B

Rationale: Organs are defined as fully differentiated body parts with specialized functions. Organ systems are groups of organs working together for a specific function. Cells are the smallest structural and functional units of the human organism. Tissues are groups of similar cell types that combine to form a specific function.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 9, Introduction

2. The charge nurse is educating a group of staff nurses about plasma membranes. Which description of the plasma membrane is accurate?
   A. Contains a single layer of lipids with polar heads
   B. Contains a single layer of lipids with nonpolar heads
   C. Contains a bilayer of lipids with polar heads
   D. Contains a bilayer of lipids with nonpolar heads

Answer: C

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Rationale: The plasma membrane represents an organized structure composed of lipids, carbohydrates, and proteins arranged in a bilayer. The lipid bilayers are mainly made up of phospholipids. The phosphate connected to the lipid structure is known as the "head." The heads are polar or hydrophilic (having an affinity to water).
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Understand
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 10, Plasma (Cell) Membrane

3. Which proteins in the plasma membrane project into either the intracellular or the extracellular environment?
   A. Transmembrane proteins
   B. Integral proteins
   C. Peripheral proteins
   D. Channel proteins

Answer: C

Rationale: Peripheral proteins do not pass through the entire membrane, projecting into either the intracellular or the extracellular environment. Proteins that pass through the entire membrane are known as transmembrane proteins, allowing communication and transport between the extracellular and intracellular environments. Integral proteins are a specific type of transmembrane protein that, because of the tight binding to lipid tails, becomes part of the membrane itself. Integral proteins often form channels that allow for the transport of ions (atoms with an electrical charge) across the plasma membrane.
Question format: Multiple Choice
Chapter: 2

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Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 10, Plasma (Cell) Membrane

4. Which organelle is responsible for synthesis of proteins by bound ribosomes?
   A. Rough endoplasmic reticulum
   B. Smooth endoplasmic reticulum
   C. Golgi apparatus
   D. Lysosome

Answer: A

Rationale: The rough endoplasmic reticulum contains ribosomes bound to its membrane that synthesize protein and produces lysosomal enzymes (acid hydrolyses). Smooth endoplasmic reticulum is responsible for the synthesis of lipids, lipoproteins, and steroid hormones, and the regulation of intracellular calcium. The Golgi apparatus prepares substances produced by the endoplasmic reticulum for secretion out of the cell. Lysosomes digest cellular debris with hydrolytic enzymes.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 11, Cytoplasm and Organelles

5. Which component is part of the cellular cytoskeleton?
   A. Mitochondria

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B. Gene
C. Cytoplasm
D. Actin

Answer: D

Rationale: The main cytoskeleton components include microtubules (thin protein structures composed of tubulin) and microfilaments. Thin microfilaments comprise the protein actin. Intermediate microfilaments comprise filaments with a diameter sized between thin and thick filaments. Thick microfilaments comprise the protein myosin. The cellular cytoskeleton does not include mitochondria, cytoplasm, or genes.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Understand
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 12, Cytoskeleton

6. Which transport mechanism requires energy?
   A. Diffusion
   B. Osmosis
   C. Facilitated diffusion
   D. Primary active transport

Answer: D

Rationale: Primary active transport requires the direct use of energy in the form of adenosine triphosphate (ATP) when transporting particles across the plasma membrane. Diffusion is the movement of particles from an area of higher

concentration to an area of lower concentration, which is an example of passive transport. Osmosis is the process by which water passively moves across the semipermeable plasma membrane. Facilitated diffusion is the movement of some substances across the plasma membrane aided by the use of transport proteins.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 12, Cellular Mechanisms of Transportation

7. Phagocytosis is an example of which type of cellular function?
   A. Ingestion
   B. Respiration
   C. Communication
   D. Reproduction

Answer: A

Rationale: Phagocytosis is the process of ingesting large particles such as cells, bacteria, and damaged cellular components by cells called phagocytes. This is one of the specific processes of ingestion that allow the cell to ingest substances necessary for its own use into the cytoplasm. Phagocytosis is not an example of respiration, communication, or reproduction.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Understand
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1

Page and Header: 13, Ingestion

8. Which form of signal transduction resulting from ligand–receptor binding has the potential to produce effects in the entire body system?
   A. Endocrine
   B. Paracrine
   C. Autocrine
   D. Local mediation

Answer: A

Rationale: Endocrine signaling occurs when signal transduction affects cell behavior within the entire organism. Paracrine signaling is ligand binding to receptors that results in signal transduction with a local, rapid effect. Autocrine signaling and local mediation are not forms of cell-to-cell communication.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 15, Communication

9. What is the process that makes cells with the same genetic material develop into specific cell types?
   A. Reproduction
   B. Differentiation
   C. Proliferation
   D. Stimulation

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Answer: B

Rationale: Cell division occurs at different times depending on the cell type and on the signals sent to the cell for division. Differentiation, or changes in physical and functional properties of cells, directs the cell to develop into specific cell types. As all cells contain identical genetic material, differentiation explains why one cell contributes to the development of one tissue while another can develop into a different tissue. This process occurs by the repression of certain genes in a cell and the expression of others in the same cell. Proliferation is the increase in cell number. Differentiation and proliferation are components of cellular reproduction. Stimulation is not a component of cellular reproduction.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 15, Reproduction

10. Which cellular change is caused by a reduction in functional demand?
    A. Atrophy
    B. Hypertrophy
    C. Hyperplasia
    D. Dysplasia

Answer: A

Rationale: Atrophy is the decrease in individual cell size, and it can occur for several reasons, including a decrease in the functional demand on a cell. Hypertrophy is an increase in cell size, and hyperplasia is an increase in cell number. Both hypertrophy and hyperplasia can be caused by hormone signaling and an increased

workload/functional demand. Dysplasia refers to the actual change in cell size, shape, uniformity, arrangement, and structure. Dysplasia is often a cell's response to a chronic and persistent stressor and is likely to resolve when the stressor is removed.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Apply
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 2
Page and Header: 16, Atrophy

11. Which term indicates increased cell size caused by an increase in functional demand?
    A. Atrophy
    B. Hypertrophy
    C. Hyperplasia
    D. Dysplasia

Answer: B

Rationale: Hypertrophy is an increase in cell size, and hyperplasia is an increase in cell number. Both hypertrophy and hyperplasia can be caused by hormone signaling and an increased workload/functional demand. Dysplasia refers to the actual change in cell size, shape, uniformity, arrangement, and structure; it is often a cell's response to a chronic and persistent stressor. Atrophy is the decrease in individual cell size, and it can be caused by decreased functional demand on a cell.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Apply
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning

Learning Objective: 2
Page and Header: 17, Hypertrophy

12. Which term indicates increased cell number caused by increased functional demand?
    A. Atrophy
    B. Hypertrophy
    C. Hyperplasia
    D. Dysplasia

Answer: C

Rationale: Hyperplasia is an increase in cell number, and hypertrophy is an increase in cell size. Both hypertrophy and hyperplasia can be caused by hormone signaling and an increased workload/functional demand. Dysplasia refers to the actual change in cell size, shape, uniformity, arrangement, and structure; it is often a cell's response to a chronic and persistent stressor. Atrophy is the decrease in individual cell size, and it can be caused by decreased functional demand on a cell.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 2
Page and Header: 17, Hyperplasia

13. What process may cause columnar cells to turn into squamous cells as a method of adaptation to a persistent stressor?
    A. Metaplasia
    B. Dysplasia

C. Apoptosis
D. Hyperplasia

Answer: A

Rationale: Metaplasia refers to the changing of one cell type to another. This is one way that cells can adapt to a persistent stressor. Dysplasia refers to the actual change in cell size, shape, uniformity, arrangement, and structure. Hyperplasia is an increase in cell number. Apoptosis is programmed cell death prompted by a genetic signal and is designed to replace old cells with new.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 3
Page and Header: 17, Metaplasia

14. Which term indicates cell death associated with inflammation?
A. Metaplasia
B. Dysplasia
C. Apoptosis
D. Necrosis

Answer: D

Rationale: Cell death by necrosis is a disorderly process associated with inflammation. Necrosis is death of cells related to cell injury. Metaplasia refers to the changing of one cell type to another. Dysplasia refers to the actual change in cell size, shape, uniformity, arrangement, and structure. Apoptosis is programmed cell death prompted by a genetic signal and is designed to replace old cells with new.

Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Remember
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 4
Page and Header: 19, Necrosis

15. Damage to cells resulting from frostbite is classified as which type of injury?
    A. Mechanical
    B. Thermal
    C. Chemical
    D. Endogenous

Answer: B

Rationale: Thermal injury is caused by extremes of temperature, as occurs with burns and frostbite. Mechanical injury can be caused by impact of a body part causing direct injury, such as falling off a skateboard or a bike. Chemical toxins include both exogenous and endogenous forms. Endogenous toxins are toxins from within the body system that cause harm to cells. Exogenous toxins are toxins from the external environment that cause harm to cells.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Apply
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 4
Page and Header: 20, Causes of Cell Injury and Death

16. Which condition is most likely to be associated with atrophic changes in breast tissue?
    A. Puberty
    B. Pregnancy
    C. Menopause
    D. Menarche

Answer: C

Rationale: The aging process can result in decreased cell size (atrophy), which translates into decreased organ size. Atrophy also can occur as a response to the removal of hormonal signals that stimulate growth, resulting in involution, or shrinkage, of tissues and organs. Atrophy may result in the manifestation of clinical signs and symptoms stemming from the decrease in size and function of the organ involved.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Apply
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Teaching/Learning
Learning Objective: 5
Page and Header: 16, Atrophy

17. While educating adolescents about menstruation, the nurse mentions that the sloughing off of the inner lining of the uterus (the endometrium) at the start of menstruation occurs by which physiologic process?
    A. Apoptosis
    B. Necrosis
    C. Oxidative stress
    D. Dysplasia

Answer: A

Rationale: Apoptosis can be both a physiologic and a pathologic cell response to cellular signals. Apoptosis is programmed cell death prompted by a genetic signal and is designed to replace old cells with new ones. Cells are programmed for death for many reasons, including damaged genetic material or mutation, old age of the cell, and an attempt to decrease the actual number of cells. Menstruation is the sloughing of the old lining of the uterus. Cell death by necrosis is a disorderly process associated with inflammation. Necrosis is the death of cells related to cell injury. Injury causes damage to cellular structures, including the mitochondria, thereby depleting adenosine triphosphate (ATP). Dysplasia refers to the actual change in cell size, shape, uniformity, arrangement, and structure. Dysplasia is often a cell's response to a chronic and persistent stressor and is likely to resolve when the stressor is removed. Oxidative stress involves exposure of cells to reactive oxygen species (ROS), toxic oxygen molecules or radicals that are formed by the reaction between oxygen (O_2) and water (H_2O) during mitochondrial respiration. Cell damage can result from too many ROS or not enough available enzymes, including catalase, to convert these radicals to less harmful substances.
Question format: Multiple Choice
Chapter: 2
Cognitive Level (Bloom's): Apply
Client Needs: Health Promotion and Maintenance
Integrated Process: Teaching/Learning
Learning Objective: 1
Page and Header: 19, Mechanisms of Cell Death

18. Which client(s) is at risk for a deficit injury that can result in cellular injury and death? Select all that apply.
    A. A middle-aged client with diabetes who is experiencing ischemia in the lower extremities

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B. The client with a 40 pack-year history of cigarette smoking admitted with deep vein thrombosis
C. Female, 6 months pregnant, who is experiencing severe nausea and vomiting
D. Athlete who fell off a bike resulting in a fracture of the tibia
E. Exercise coach who has pulled a muscle in the back and experiencing some acute pain
F. The young client who has begun an intense exercise routine along with a decreased food intake after being called "fat"

Answer: A, B, C, F

Rationale: Damage to cells can result from deficit injury, in which the cell is deprived of oxygenation, hydration, and nutrition. This type of injury is commonly seen in conditions of ischemia (such as a client with diabetes and circulation issues in the lower legs or a client with deep vein thrombosis due to smoking), severe malnutrition (such as prolonged nausea/vomiting during pregnancy), and eating disorders such as anorexia nervosa (such as a client exercising intensely while minimizing food intake). A pulled muscle or bone fracture from an accident does not necessarily cause a deficit injury.
Question format: Multiple Select
Chapter: 2
Cognitive Level (Bloom's): Analyze
Client Needs: Physiological Integrity: Reduction of Risk Potential
Integrated Process: Nursing Process
Learning Objective: 4
Page and Header: 20, Causes of Cell Injury and Death

19. Which statement(s) regarding testing a client for acromegaly is an accurate interpretation of the results? Select all that apply.
A. Growth hormone levels will need to be collected daily for an entire week.

B. The best time to collect growth hormone levels is during the middle of the night.
C. Growth hormone should be measured as a component of a glucose tolerance test.
D. Following ingestion of 75 g of glucose, it is normal for growth hormone levels to decrease.
E. An elevated growth hormone level 1 hour after the glucose ingestion indicates that the negative feedback regulation is normal.

Answer: C, D

Rationale: Measurement of growth hormone is most accurate when measured as a component of a glucose tolerance test because growth hormone secretion is influenced by blood glucose levels. Under physiologic conditions, growth hormone levels decrease when blood glucose levels rise via negative feedback regulation. Growth hormone levels can be tested after a glucose tolerance test to determine if there is an alteration in negative feedback, indicating pathologic secretion of growth hormone. Within 2 hours of ingestion of 75 g of glucose, growth hormone is suppressed to less than 1 ng/mL (1 µg/L) under physiologic conditions. An elevated growth hormone level 1 hour after the glucose ingestion indicates that glucose did not suppress growth hormone secretion, leading to the diagnosis of acromegaly.
Question format: Multiple Select
Chapter: 2
Cognitive Level (Bloom's): Apply
Client Needs: Physiological Integrity: Reduction of Risk Potential
Integrated Process: Nursing Process
Learning Objective: 6
Page and Header: 25, Acromegaly

20. A woman is diagnosed with cervical intraepithelial neoplasia (CIN) with absent glandular cell involvement and no invasive squamous cell disease. When clarifying

treatment options and educating this client about the new diagnosis, which topic(s) will the nurse include in the discussion? Select all that apply.

A. Total hysterectomy
B. Cryosurgery
C. CO_2 laser ablation
D. Electrocoagulation diathermy ablation
E. No surgical treatment options warranted at this time

Answer: B, C, D

Rationale: Treatment to remove superficial cells (ablative) is an option for women with cervical intraepithelial neoplasia (CIN) in the absence of glandular cell involvement or invasive squamous cell disease. Cryosurgery, a form of cold therapy that destroys mildly dysplastic cells, is a common ablative therapy for cervical dysplasia. Liquid nitrogen is applied to the dysplastic cells on the exocervix, identified by colposcopy via a probe placed in the desired area. CO_2 laser ablation is accomplished by directing a laser toward the cervical lesion under colposcopic guidance, destroying the tissue by vaporization. Heat ablation methods include cold coagulation and electrocoagulation diathermy ablation, with variations in temperature and time of treatment associated with depth of cervical tissue destruction. In cases of carcinoma, a hysterectomy may be indicated.
Question format: Multiple Select
Chapter: 2
Cognitive Level (Bloom's): Understand
Client Needs: Physiological Integrity: Physiological Adaptation
Integrated Process: Nursing Process
Learning Objective: 7
Page and Header: 29, Cervical Metaplasia and Dysplasia

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