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Multiple Choice

1. Which of the following statements is correct?

A. Mesothelium is a type of flat (squamous) epithelium lining the pleural cavity and external (pleural) surface of the lung.
B. Epithelium consists of small groups of cells dispersed in a large amount of extracellular material called matrix.
C. Cartilage is a type of modified epithelium.
D. Endothelium is a type of stratified squamous epithelium.

Ans: A
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2. Which of the following processes is not involved in the movements of materials in and out of the cell?

A. Diffusion
B. Osmosis
C. Pinocytosis
D. Filtration

Ans: D
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3. Which of the following statements is incorrect?

A. The nucleus directs the metabolic functions of the cell.
B. Organelles are small chromosome fragments.
C. Migration of water molecules across the semipermeable membrane from a more dilute to a more concentrated solution is called osmosis.
D. The rough endoplasmic reticulum contains ribosomes attached to its membrane that synthesize protein molecules.

Ans: B
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4. The normal osmolarity of blood and body fluids is 300 mOsm/L. A person with severe diabetes and a greatly elevated blood glucose has a blood osmolarity of 370 mOsm/L. Which of the following events will result from the increased osmolarity?

A. Water shifts by osmosis from the cells into the extracellular fluid (ECF).
B. No water shifts will occur between the cells and the extracellular fluids as a result of the higher osmolarity of the subject's blood and body fluids.
C. Water shifts by osmosis from the extracellular fluid into the cells.
D. Equal amounts of water move from the cells into the ECF and from the ECF into the cells, and thus, there is no net change in the water content of either the cells or the ECF.

Ans: A
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5. The activities of the cell are directed by which cell structure?

A. Cytoplasm
B. Organelles
C. Cell membranes
D. Nucleus

Ans: D
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6. Enzymes that use oxidation to convert food materials into energy are found in sausage-shaped structures called _____.

A. endoplasmic reticulum
B. ribosomes
C. mitochondria
D. Golgi apparatus

Ans: C
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7. Mitochondria, endoplasmic reticulum, Golgi apparatus, lysosomes, and centrioles are all examples of _____.

A. cell membranes
B. organelles
C. enzymes
D. None of the above

Ans: B
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8. Choose the answer below that best completes following statement: An *organ* is _____.

A. an object within the abdominal cavity that processes food, water, and air.
B. a complex structure that evolves from a single cell.
C. a group of different tissues integrated to perform a specific function.
D. a collection of similar cells that have an identical function.

Ans: C
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9. How many types of muscle tissue exist in the body, and what are they called?

A. Four: cardiac, skeletal, smooth, and striated.
B. Two: smooth and striated.
C. Three: smooth, striated, and cardiac.
D. One: all muscle tissue is the same.

Ans: C
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10. Choose the answer below that best completes the sentence: DNA is composed of _____ base chemicals called _____.

A. 4; adenine, thymine, guanine, cytosine
B. 3; nucleotide, deoxyribose, base
C. 2: chromosomes, proteins
D. None of the above.

Ans: A
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11. Which of the terms below does *not* describe a method by which cells adapt to changing conditions?

A. Hypertrophy
B. Hyperplasia
C. Increased enzyme synthesis
D. Necrosis

Ans: D
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12. An injured cell may commonly show which of the following changes?

A. Sodium and water diffuse into the cell, causing it to swell and sometimes to rupture.
B. Fat droplets accumulate within the cytoplasm.
C. Cell death, occasionally leading to necrosis.
D. All of the above.
E. None of the above.

Ans: D
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13. Dysplasia of epithelial cells sometimes results from which of the following?

A. Excessive sodium intake
B. Chronic irritation or inflammation
C. Increased enzyme synthesis
D. Apoptosis

Ans: B
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14. Choose the response that correctly identifies which components are true or false in the following statement: Fat stored in adipose tissue functions as (1) stored energy, (2) padding and insulation, and (3) support for internal organs and bones.

A. 1 and 2 are true, but not 3
B. 1 and 3 are true, but not 2

C. 2 and 3 are true, but not 1
D. 1, 2, and 3 are all true

Ans: A
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15. The cells in nerve tissue that are responsible for transmitting nerve impulses are called _____.

A. astrocytes
B. microglia
C. neurons
D. oligodendroglia

Ans: C
Page: 27

16. An *organ system* is composed of:

A. three distinct layers called germ layers.
B. connective and supporting tissues.
C. a group of organs organized to perform complementary functions.
D. muscle and nerve tissues.

Ans: C
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17. The function of *lysosomes* is to:

A. break down particles or worn-out cellular components.
B. convert food materials into energy.
C. produce digestive enzymes and antibody proteins.
D. aid in cell division.

Ans: A
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True/False

18. Endocrine glands discharge their secretions directly into the bloodstream, while secretions from exocrine glands discharge through ducts.

Ans: True
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19. During contraction of a muscle fiber, actin filaments slide outward and lengthen the fiber.

Ans: False
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20. Nerve tissue is composed entirely of cells called neuroglia.

Ans: False
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21. During DNA synthesis, the chemical structure of the bases means that adenine *always* pairs with thymine and guanine *always* pairs with cytosine.

Ans: True
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22. Phagocytosis is a method by which cells ingest particles that are too large to cross through the cell membrane by other means.

Ans: True
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23. All necrotic cells are dead, but not all dead cells are necrotic.

Ans: True
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24. *Neoplasia* is a term for dysplastic cells that undergo malignant transformation.

Ans: True
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25. Cell death normally does not occur unless there has been an injury to the cell.

Ans: False
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26. Specific types of cells often can be identified by examining structures called *intermediate filaments* in the cytoskeleton.

Ans: True
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27. The trophoblast is the part of the fertilized ovum that eventually grows into an embryo.

Ans: False
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28. Parenchyma is the total mass of functional tissue.

Ans: True
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29. Stroma is the supporting framework of an organ

Ans: True
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30. Various supporting tissues such as cartilage and bone are derived from the endoderm.

Answer: False
See page: 29

Matching

31. Match each term with its definition:

___ Collagen fibers
___ Elastic fibers
___ Reticulin fibers
___ Matrix

A. Fibers that stretch readily and return to their former shape
B. An extracellular material into which various fibers are embedded
C. Thin, delicate fibers that form in a fine meshwork to support organs such as the liver
D. Long, flexible fibers that are strong but do not stretch

Ans: D, A, C, B
Page: 27

32. Match each term below with the type of cells, functions, or organs that are derived from it:

___ Ectoderm
___ Inner cell mass
___ Entoderm
___ Mesoderm

A. Tissues used for support, motion, circulation, urination, generation
B. Tissues that form inner layers of the body and linings of organs
C. Tissues that form the external covering of the body and organs that contact the external environment
D. The collection of cells that gives rise to the distinct germ layers

Ans: C, D, B, A
Page: 28

33. Match each term with its role in the genetic code.

___ Messenger RNA
___ Transfer RNA
___ Chromosome
___ Nucleotide

A. Picks up required amino acids from the cytoplasm and transfers them to the ribosomes for assembly
B. Basic structural unit of DNA consisting of a phosphate group linked to a five-carbon sugar
C. Carries instructions from the nucleus to the ribosomes in the cytoplasm
D. Contains a series of messages called the genetic code that regulates cell functions

Ans: C, A, D, B
Page: 30-31

34. Match the terms below to the correct definitions.

___ Metaplasia
___ Hypertrophy
___ Atrophy
___ Neoplasia
___ Hyperplasia
___ Apoptosis
___ Necrosis
___ Dysplasia

A. Programmed cell death
B. A change from one type of cell to another type better able to tolerate adverse conditions
C. Disturbed or abnormal development and maturation of cells
D. Structural changes occurring in dead cells
E. Reduction in the size of cells in response to less favorable conditions
F. An increase in the size of a tissue or organ due to an increased number of cells
G. An increase in the size of individual cells
H. Development of a mass of abnormal cells called a tumor

Ans: B, G, E, H, F, A, D, C
Page: 34-36

Short Answer

35. What is apoptosis? What happens in the body when apoptosis mechanisms cease to function properly?

Ans: Pre-determined or programmed cell death. If apoptosis mechanisms cease to function properly, cells may continue to proliferate and accumulate in organs or tissues, causing diseases or tumors.
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36. List three possible causes of cell aging.

Ans: Genetic pre-programming (inherent property of the cell); decreased activity or efficiency of enzyme systems; damage to cellular DNA, RNA, and organelles.
Page: 36-37

37. What are the three different types of protein tubules and filaments in the cell cytoskeleton? What are the principal functions of these structures?

Ans: Microtubules, microfilaments, and intermediate filaments; they form the structural framework of the cell and are responsible for cell movements.
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38. What are the two types of nucleic acid combined with protein found in the nucleus of the cell? Where does each type of nucleic acid occur within the cell?

Ans: Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). DNA is found in the chromosomes. RNA is found in the nucleoli.
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39. Name the four major tissue groups.

Ans: Epithelium, connective and supporting tissues, muscle tissue, and nerve tissue.
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40. Name four types of connective and supporting tissue.

Ans: Any four of the following: loose fibrous tissue, dense fibrous tissue, elastic tissue, reticular tissue, adipose tissue, cartilage, bone, hematopoietic tissue, lymphatic tissue, subcutaneous tissue,

ligaments, tendons, blood vessel wall membranes, bronchi walls, trachea, supporting framework of organs
Page: 26-27

41. List the three ways that oxygen, nutrients, and waste products cross the cell membrane.

Ans: Diffusion and osmosis; active transport; phagocytosis and pinocytosis
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42. Differentiate dysplasia from metaplasia.

Ans: Dysplasia: abnormal maturation of cells, resulting in varied cell shape and size
Metaplasia: change from one cell type to another
Page: 34-35

43. Differentiate hyperplasia from hypertrophy.

Ans: Hyperplasia: increase in cell size with an increase in cell number
Hypertrophy: increase in cell size without an increase in cell number
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Essay

44. Compare and contrast diffusion versus osmosis.

Ans: Diffusion is the passage of dissolved particles or solute from a more concentrated to a more dilute solution; osmosis is the movement of water molecules from a dilute to a more concentrated solution.
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45. Compare and contrast phagocytosis versus pinocytosis.

Ans: Phagocytosis is the ingestion of particles too large to pass across the cell membrane; pinocytosis is the ingestion of fluid.

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46. Define and give an example of hypertrophic change.

Ans: Increase in cell size without an increase in cell number; hypertrophy of the heart in chronic hypertension
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47. Describe the process and direction of movement of water in severe uncontrolled diabetes.

Ans: The high glucose concentration increases the ECF osmolarity, and water moves by osmosis from the cells into the extracellular fluid.
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48. Explain the direction of water movement in renal failure.

Ans: Water is not excreted by the kidneys, and the excess water dilutes the ECF, resulting in a lower osmolarity. Therefore, water moves from the ECF into the cells, causing the cells to swell.
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49. Explain why a liver exposed to chronic injury as in hepatitis or alcoholism becomes swollen.

Ans: The liver becomes swollen because of fatty liver change or an increased accumulation of fat droplets in the cytoplasm due to the impairment of enzyme systems that metabolize fat. This is an initial reaction to injury. If the offending organism is not eliminated, the liver eventually undergoes scarring or cirrhosis as a result of chronic inflammatory process.
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50. Explain increased enzyme synthesis in chronic alcoholism.

Ans: Increased elimination, metabolism, or detoxification of drugs or chemicals by increased synthesis of enzymes in the SER occurs in alcoholism; a person is much more able to metabolize alcohol as the body’s response to chronic exposure to alcohol.
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