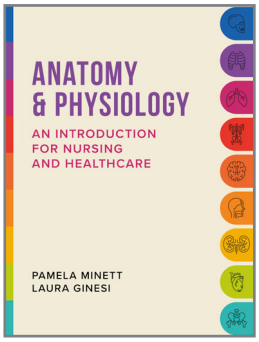
Lantern



Questions to accompany *Anatomy and Physiology*

CHAPTER 2 HISTOLOGY

Multiple Choice Questions (MCQs)

Each question consists of a stem statement or question, and 5 options. You must pick the one correct answer.

1. What is the basic structural and functional unit of the human body?

A. protein
B. glucose
C. tissue
D. organ
E. cell

2. Which of the following would NOT be seen in a histology section of human tissue, such as a biopsy?

A. cytoplasm
B. nucleus
C. blood
D. cell wall
E. proteins

3. Which of the following is a function of the plasma membrane of the cell?

A. production of energy
B. synthesis of proteins
C. processing of cell products for export
D. separating chromosomes from each other
E. separating the contents of the cell from the external environment (interstitial fluid)

4. Plasma membranes are said to be:

A. semipermeable
B. freely permeable
C. impermeable
D. leaky
E. actively permeable

5. Most of the energy a cell needs to perform its functions is made in:

A. endoplasmic reticulum
B. nucleus
C. mitochondria
D. ribosomes
E. lysosomes

6. Which intracellular organelle consists of layers of membrane studded with ribosomes?

A. mitochondrion
B. rough endoplasmic reticulum
C. smooth endoplasmic reticulum
D. Golgi apparatus
E. nucleus

7. The term *exocytosis* refers to a cell's ability to:

A. export products it has made
B. produce a steady source of ATP
C. divide and replicate itself
D. communicate with other cells
E. respond to a stimulus

8. The layers of cells that form the lining of the mouth and vagina are examples of:

A. squamous epithelium
B. germinal epithelium
C. stratified epithelium
D. glandular epithelium
E. ciliated epithelium

9. What are the star-shaped cells of the central nervous system that form the blood–brain barrier known as?

A. astrocytes
B. microglia
C. Schwann cells
D. ependymal cells
E. oligodendrocytes

10. Cardiac muscle cells (cardiomyocytes):

A. do not have a nucleus
B. are found in the walls of hollow organs
C. form long fibres with many nuclei
D. are myogenic
E. easily become fatigued

Critical thinking: ARQs (assertion reasoning questions)

These questions consist of two statements:
- an assertion, and
- a reason.

You must first determine whether each statement is *TRUE* or *FALSE*.
- If both statements are true, you must next determine whether the reason correctly explains the assertion. The answer will be option 1 or option 2.
- If one statement is true and the other is false then the answer is option 3 or option 4, depending on which of the statements is correct.
- If both statements are false, then the answer is option 5.

There is one option for each possible outcome.

Question 11

A = the Assertion	**R = the Reason**
Plasma membranes form the structure that covers and protects the body	Plasma membranes form the flexible boundaries that separate cells from each other
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the correct explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Question 12

A = the Assertion	R = the Reason
Neurons can be classified as sensory, motor or interneurons according to their function and location	Glia are specialised cells that surround neurons, hold them in place and supply nutrients
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the correct explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Question 13

A = the Assertion	R = the Reason
During the process of exocytosis, storage vesicles fuse with the plasma membrane and release their contents into the extracellular space	Plasma cells produce antibodies to protect the body during an immune response
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the correct explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Deepening your learning

Question 14

a) Explain, in your own words, what the term cell organelle means.
b) Briefly describe the function of each of the following:
   - nucleus
   - cytoskeleton
   - Golgi apparatus
c) Explain, in physiological terms, the difference between tissue and organ. Illustrate your answer by applying knowledge of muscle as an example.
d) Outline the special characteristics of three different types of connective tissue in the human body.

Putting it all together

Question 15

Construct a flow chart or spider diagram that shows the inter-relationship between cells and tissues of the human body.
Include the following key words in your sketch:

Active transport	Epithelium	Organelle
Carrier-mediated transport	Exocytosis	Osmosis
Cells	Golgi apparatus	Plasma membrane
Connective tissue	Mitochondria	Tissues
Diffusion	Muscle	Vesicle
Endocytosis	Nerve tissue	Waste
Endoplasmic reticulum	Nucleus	Stratified epithelium

Write notes on your diagram that explain the words.

- You may repeat words or add any additional words that you need to create your figure.

Answers to questions

Answers are supplied to most, but not all questions. Some may require you to carry out further research using the book.

Multiple Choice Questions (MCQs)

Each question consists of a stem statement or question, and 5 options. You must pick the one correct answer.

1. **What is the basic structural and functional unit of the human body?**
   E. cell

2. **Which of the following would NOT be seen in a histology section of human tissue, such as a biopsy?**
   D. cell wall

3. **Which of the following is a function of the plasma membrane of the cell?**
   E. separating the contents of the cell from the external environment (interstitial fluid)

4. **Plasma membranes are said to be:**
   A. semipermeable

5. **Most of the energy a cell needs to perform its functions is made in:**
   C. mitochondria

6. **Which intracellular organelle consists of layers of membrane studded with ribosomes?**
   B. rough endoplasmic reticulum

7. **The term *exocytosis* refers to a cell's ability to:**
   A. export products it has made

8. **The layers of cells that form the lining of the mouth and vagina are examples of:**
   C. stratified epithelium

9. **What are the star-shaped cells of the central nervous system that form the blood–brain barrier known as?**
   A. astrocytes

10. **Cardiac muscle cells (cardiomyocytes):**
    D. are myogenic

Critical thinking: ARQs (assertion reasoning questions)

These questions consist of two statements:
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- a reason.

You must first determine whether each statement is *TRUE* or *FALSE*.
- If both statements are true, you must next determine whether the reason correctly explains the assertion. The answer will be option 1 or option 2.
- If one statement is true and the other is false then the answer is option 3 or option 4, depending on which of the statements is correct.
- If both statements are false, then the answer is option 5.

There is one option for each possible outcome.

Question 11

A = the Assertion	R = the Reason
Plasma membranes form the structure that covers and protects the body	Plasma membranes form the flexible boundaries that separate cells from each other
4. A is false but R is true	

Explanation

The Assertion (A) is *FALSE*. The structure that covers and protects the human body is the skin (also known as the integumentary system).

Plasma membranes are thin, flexible structures made from phospholipids, protein and cholesterol. They surround every living cell, separating it from the environment, creating a semi-permeable barrier. Human cells also have functionally inter-related membranous organelles – the nuclear envelope, endoplasmic reticulum, Golgi apparatus and vesicles – which have a common feature of phospholipid bilayer, although proteins are different in every case. Thus the Reason (R) is *TRUE*.

Option 4 is the correct answer.

Question 12

A = the Assertion	R = the Reason
Neurons can be classified as sensory, motor or interneurons according to their function and location	Glia are specialised cells that surround neurons, hold them in place and supply nutrients
2. Both A and R are true but R is NOT the correct explanation of A	

Explanation

The Assertion (A) is *TRUE*. There is wide variation in the shapes and sizes of individual neurons, so they are classified into three major groups according to their function and location. Sensory neurons transmit impulses from the periphery to the central nervous system, while motor neurons transmit impulses away from the central nervous system. Interneurons are located only within the central nervous system.

The Reason (R) is *TRUE*. The function of all the different types of glial cell is to support neurons and ensure that they have a continual supply of nutrients.

However, the two statements are independent of each other and R is not a correct explanation of A, so **option 2 is the correct answer.**

Question 13

A = the Assertion	R = the Reason
During the process of exocytosis, storage vesicles fuse with the plasma membrane and release their contents into the extracellular space	Plasma cells produce antibodies to protect the body during an immune response

2. Both A and R are true but R is NOT the correct explanation of A

Explanation

The Assertion (A) is *TRUE*. Exocytosis is the process by which molecules including proteins and neurotransmitters are released to the outside of the cell. The substances are transferred from the Golgi apparatus to the plasma membrane in vesicles; these fuse with the membrane and release their contents to the extracellular environment.

The Reason (R) is *TRUE*. Plasma cells are mature B-lymphocytes, which have been stimulated to produce thousands of antibody molecules every second. This function is an essential part of the immune response.

However, the two statements are independent of each other and R is not a correct explanation of A so **option 2 is the correct answer**.