1. Base your answer to the following question on the diagram below and on your knowledge of biology.



Structure *B* represents

- A) cells, only
- B) cells and tissues, only
- C) an organ with cells and tissues
- D) a complete system with organs, tissues, and cells
- 2. People who receive organ transplants sometimes produce antibodies in response to foreign proteins present in the organ of the donor. This reaction is an example of
  - A) clotting B) deamination
  - C) regeneration **D) rejection**
- 3. A dead or weakened pathogen used to establish immunity would most likely be found in
  - A) an antibioticB) a toxinC) a pesticideD) a vaccine
- 4. In response to an increasing blood glucose level, the human body will normally
  - A) produce a hormone that destroys the glucose
  - B) store the glucose in cell nuclei
  - C) release a hormone that lowers the blood glucose
  - D) use the excess glucose to make proteins
- 5. Whole blood of type O may safely be given to people with which types of blood?
  - A) O and B, only B) AB and A, only
  - **C)** A, B, AB, and O D) A and B, only

6. Which diagram best represents a blood cell from a person with type O blood?



7. The diagram below represents a reflex arc.



- The function of the neuron labeled X is to
- A) direct impulses from the receptor to the spinal cord
- B) transmit impulses from a sensory neuron to a motor neuron
- C) initiate responses by stimulating the receptor
- D) transmit impulses from the effector to the brain
- 8. An individual who has had chicken pox rarely gets this disease again. This situation is an example of
  - A) negative feedback B) biological control
  - C) passive immunity **D**) active immunity
- 9. Which organ system in humans is most directly involved in the transport of oxygen?

A) digestive	B) excretory
C) circulatory	D) nervous



Base your answers to questions 14 and 15 on "the graph below.

#### Incidence of Three Human Diseases in Four Different Years



14. Which statement best explains a change in the incidence of disease in 1970?

#### A) Children were vaccinated against measles.

- B) The bacteria that cause pneumonia developed a resistance to drugs.
- C) New drugs cured diabetes.
- D) New technology helped to reduce the incidence of all three diseases.
- 15. Which statement provides the best possible reason for the decrease in number of cases of bacterial pneumonia from 1940 to 1970?
  - A) The bacteria did not respond to medical treatments.
  - B) As a result of sexual reproduction, the bacteria evolved into a harmless form.
  - C) Antibiotics were made available for the treatment of bacterial infections.
  - D) As a result of genetic engineering, humans became immune to the bacteria.
- 16. A series of enzyme-controlled reactions that occur when platelets rupture is known as
  - A) anemia B) passive immunity
  - **C) blood clotting** D) asthma
- 17. The human immune system fights infection by releasing
  - A) antibodies B) antigens
  - C) antibiotics D) ATPs

Base your answers to questions **18** through **20** on " the diagram below and on your knowledge of biology.



- 18. The process represented in the diagram best illustrates
  - A) waste disposal
  - B) muscle contraction
  - C) cellular communication
  - D) extraction of energy from nutrients
- 19. Which statement best describes the diagram?
  - A) Nerve cell *Y* is signaling nerve cell *X*.
  - **B)** Nerve cell *Y* contains receptor molecules for substance *A*.
  - C) Nerve cell X is releasing receptor molecules.
  - D) Nerve cell X is attaching to nerve cell Y.
- 20. A drug is developed that, due to its molecular shape, blocks the action of substance *A*. Which shape would the drug molecule most likely resemble?



- 21. Which sequence represents structures organized from most complex to least complex?
  - A) chloroplast  $\rightarrow$  guard cell  $\rightarrow$  leaf  $\rightarrow$  oak tree
  - B) guard cell  $\rightarrow$  chloroplast  $\rightarrow$  leaf  $\rightarrow$  oak tree
  - C) oak tree  $\rightarrow$  leaf  $\rightarrow$  guard cell  $\rightarrow$  chloroplast
  - D) oak tree  $\rightarrow$  guard cell  $\rightarrow$  leaf  $\rightarrow$  chloroplast
- 22. Humans breathe more rapidly during exercise than before it because during exercise the blood contains
  - A) a decreased amount of hemoglobin
  - B) an increased level of oxygen
  - C) a decreased number of red blood cells
  - D) an increased level of carbon dioxide

23. The two reactions illustrated in the diagrams below often occur when a foreign substance enters the body.



The cells labeled A and B are examples of cells known as

- A) specialized skin cells
- C) guard cells

- B) white blood cellsD) reproductive cells
- 24. The diagram below represents three human body systems.



Which row in the chart below correctly shows what systems A, B, and C provide for the human body?

Row	System A	System B	System C
(1)	blood cells	glucose	hormones
(2)	oxygen	absorption	gametes
(3)	gas exchange	nutrients	waste removal
(4)	immunity	coordination	carbon dioxide

A) (1) B) (2) C) (3) D) (4)

25. Insulin is a molecule, produced by the endocrine system, which regulates sugar concentration in the blood. Most likely, insulin is a

D) DNA

A) cell	B) hormone
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C) sugar

- 26. Which is a correct route of an impulse in a reflex arc?
  - A) sensory neuron  $\rightarrow$  effector  $\rightarrow$  motor neuron  $\rightarrow$  receptor  $\rightarrow$  interneuron
  - B) motor neuron  $\rightarrow$  sensory neuron  $\rightarrow$  interneuron  $\rightarrow$  effector
  - C) receptor  $\rightarrow$  sensory neuron  $\rightarrow$  interneuron  $\rightarrow$  motor neuron  $\rightarrow$  effector
  - D) effector  $\rightarrow$  receptor $\rightarrow$  motor neuron  $\rightarrow$ sensory neuron  $\rightarrow$  interneuron
- 27. The diagram below shows the interaction between blood sugar levels and pancreatic activity.



This process is an example of

- A) a feedback mechanism maintaining homeostasis
- B) the digestion of sugar by insulin
- C) the hormonal regulation of gamete production
- D) an immune system responding to prevent disease

28. The diagram below represents a portion of the human body.



The principal function of structure X is to

- A) secrete sex hormones
- B) digest bile
- C) absorb water
- D) produce salivary enzymes
- 29. Newborn infants nursing from their mother receive milk containing antibodies against diseases to which the mother is immune. The infants, however, remain immune to those diseases for only a short time. This situation is an example of
  - A) active immunity
  - B) a phagocytic activity
  - C) passive immunity
  - D) an oral vaccine
- 30. Which sequence represents structures organized from least complex to most complex?
  - A) brain  $\rightarrow$  nervous system  $\rightarrow$  nucleus  $\rightarrow$  nerve cell
  - B) nervous system  $\rightarrow$  brain  $\rightarrow$  nerve cell  $\rightarrow$  nucleus
  - C) nucleus  $\rightarrow$  nerve cell  $\rightarrow$  brain  $\rightarrow$  nervous system
  - D) nerve cell  $\rightarrow$  nucleus  $\rightarrow$  nervous system  $\rightarrow$  brain
- 31. Secondary sex characteristics in males are regulated by

A) testosterone	B) amylase
C) acetylcholine	D) estrogen

32. The diagram below shows how a chemical message produced by one cell is received by other cells.



If these chemical messages are destroyed, the target cells will

- A) no longer be produced in the organism
- **B)** not respond with appropriate actions
- C) develop different receptors
- D) produce their own chemical messages
- 33. Which statement correctly describes the activities of the components of human blood shown in the diagram below?



- A) Both *A* and *B* function in immune responses, and *C* transports oxygen.
- **B)** A transports oxygen, B initiates clots, and C functions in immune responses.
- C) Both *B* and *C* provide immunity, and *A* transports nutrients.
- D) A, B, and C are able to synthesize hemoglobin.
- 34. An allergic reaction to certain types of natural, unprocessed foods, such as peanuts, is caused by
  - A) a lack of digestive enzymes
  - B) microorganisms living within the food
  - C) a response to specific antigens
  - D) high levels of carbon dioxide in the air

35. Activities in the human body are represented in the diagram below



Which title would be appropriate for the diagram?

- A) The Nervous System Responds to Changes in Blood Sugar Levels
- B) Feedback Mechanisms Help to Maintain Homeostasis
- C) Rate of Excretion Varies in Response to Amount of Water Taken In
- D) Respiratory Rate Responds to an Increase in Muscle Activity

36. Which statement best describes an immune 37. The kidney is an organ that collects wastes and excess water from the blood and sends them to the response? bladder where they are stored before being removed A) It releases red blood cells that destroy parasites. from the body. Which two systems work together to **B)** It usually involves the recognition and perform this function? destruction of pathogens. A) circulatory and excretory C) It always produces antibiotics. B) immune and respiratory D) It stimulates asexual reproduction and C) digestive and circulatory resistance in pathogens. D) skeletal and nervous

Base your answers to questions **38** and **39** on the diagrams below and on your knowledge of biology. The diagrams represent a single-celled organism and a multicellular organism.



- 38. Which statement correctly identifies the levels of organization for the structures indicated?
  - A) A and B are organelles; E and G are organs.
  - B) A and B are tissues; E and G are organs.
  - C) A and B are tissues; E and G are organelles.
  - D) A and B are organs; E and G are systems.
- 39. Rotenone is an insecticide that is toxic to humans as well as to insects. Rotenone interferes with the process of ATP production in the cell. Which row in the chart below correctly identifies the structure where ATP is produced and the reason it is affected by rotenone?

Row	Structure	Reason Affected		
(1)	Α	It would be unable to store enzymes for ATP production.		
(2)	В	Production of ATP would occur less efficiently.		
(3)	С	The raw materials used for ATP production would be altered.		
(4)	D	Absorption of the ATP would increase here.		
A) 1		B) 4	C) 2	D) 3

40. One similarity between cell receptors and antibodies is that both	41. An individual eats a hamburger. Which two systems must interact to transfer the nutrients in the	
<ul><li>A) are produced by nerve cells</li><li>B) are involved in digestion</li></ul>	hamburger to human muscle tissue? A) digestive and circulatory	
C) slow the rates of chemical reactions	B) digestive and immune	
D) are highly specific in their actions	C) circulatory and respiratory	
	D) respiratory and excretory	

42. Base your answer to the following question on "the diagram below.



Which letter indicates a structure that is not involved in the production or delivery of gametes?

A)	Α	B) B	C) C	D) D	E) F	
<ul> <li>43. W fun</li> <li>A)</li> <li>B)</li> <li>C)</li> <li>D)</li> <li>44. W</li> <li>an</li> <li>A)</li> <li>B)</li> <li>C)</li> <li>D)</li> </ul>	<ul> <li>hich part of the netion?</li> <li>) platelets – proprint plasma – trading</li> <li>) white blood certain is a major of the dist is a major of white blood certain is a major of white blood certain do not.</li> <li>) Red blood certain do not.</li> </ul>	ne blood is correct roduce antibodies <b>nsports wastes an</b> cells – carry oxy lls – fight infection difference betwe cells? <b>ells contain hemogonot.</b> ells contain nucle ells engulf foreig cells do not. ells can move, bu	tly paired with its <b>d hormones</b> gen on een red blood cells <b>globin, but white</b> blood n bacteria, but tt white blood cells	<ul> <li>45. In 1995, c approxim. Which states based on the based on t</li></ul>	huring an Ebola virus outbreak ately 80% of the infected indiv- ately 80% of the infected indiv- atement is an inference that cou- this information? Individuals who survived were at Ebola antigens <b>adividuals who survived were at</b> <b>ce antibodies against the Ebola</b> by percent of the population was a viral antigen. by percent of the population had nity to the Ebola virus. received a flu shot in the fall. a, the student caught a cold. The evaccine he received did not p that ness was not caused by a patho <b>ccine he received contained only</b> <b>ns</b> I not get the vaccine at the righ dy produced antibiotics in response	viduals died. ald be made not exposed <b>ble to</b> <b>virus</b> is infected a natural During the e most likely revent the ogen <b>y flu virus</b> t time of ponse to the

47. Base your answer to the following question on the diagram and graph below and on your knowledge of biology. The diagram represents the human digestive system. Pepsin and trypsin are human digestive enzymes.



The graph indicates that pepsin would function best in the

A) large intestine **B)** stomach

C) small intestine D) mouth

48. The diagram below represents levels of glucose and insulin found within the bloodstream of a healthy person throughout the course of the day.



The increase in insulin levels following an increase in glucose levels in the blood can best be explained by

- A) insulin being released into the blood to digest glucose
- B) an excess of glucose-stimulating guard cells
- C) a feedback mechanism that regulates blood glucose levels
- D) a response of the immune system to lower excess blood glucose levels

49. Cellular communication is illustrated in the diagram below.



Information can be sent from

- A) cell *A* to cell *B* because cell *A* is able to recognize signal 2
- B) cell *A* to cell *B* because cell *B* is able to recognize signal 1
- C) cell *B* to cell *A* because cell *B* is able to recognize signal 2
- **D)** cell *B* to cell *A* because cell *A* is able to recognize signal 1

# Answer Key Unit 3 - Homeostasis and the Human Body

1.	C	37.	A
2.	D	38.	A
3.	D	39.	С
4.	C	40.	D
5.	C	41.	Α
6.	D	42.	D
7.	B	43.	B
8.	D	44.	Α
9.	<u> </u>	45.	B
10.	<u> </u>	46.	B
11.	C	47.	B
12.		48.	С
13.	C	49.	D
14.	A		
15.	C		
16.	C		
17.	A		
18.	C		
19.	B		
20.	B		
21.	C		
22.	D		
23.	B		
24.	C		
25.	B		
26.	C		
27.	A		
28.	C		
29.	C		
30.	C		
31.	A		
32.	B		
33.	B		
34.	C		
35.	B		
36.	В		