**Vocabulary Refresher**

**Group A**  
*Directions - Match the correct definition for the following terms:*

1. **T** Dynamic equilibrium  
   A. The system of organs involved in the intake and exchange of oxygen and carbon dioxide.

2. **J** Digestive system  
   B. A respiratory disease in which lungs have a diminished ability to absorb oxygen.

3. **F** Villi  
   C. A condition in which the bronchi tubes become restricted due to a reaction to allergens or environmental air pollutants.

4. **M** Enzymes  
   D. Muscular blood vessels that transport blood away from the heart.

5. **A** Respiratory system  
   E. Blood vessels that transport blood back to the heart.

6. **L** Hemoglobin  
   F. Special structures found in the small intestines, which aid in the absorption of nutrients into the blood stream.

7. **B** Emphysema  
   G. The smallest of all blood vessels that allow for exchanges to occur at the cellular level.

8. **C** Asthma  
   H. Acts to transport nutrients and oxygen to cells and to remove waste products from cells.

9. **H** Circulatory system  
   I. A set of conditions that are constantly changing within an organism, in order to maintain a stable environment for the organism.

10. **G** Capillaries  
    J. A group of organs that all work towards breaking down nutrients into a smaller, usable form for cell use.

11. **D** Arteries  
    K. Blood cell fragments used to clot blood.

12. **E** Veins  
    L. A respiratory pigment, located on red blood cells, mainly responsible for transporting oxygen.

13. **K** Platelets  
    M. Protein molecules that act as biological catalysts, which speed up chemical reactions.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excretory system</td>
<td>Disc shaped cells used to carry oxygen and carbon dioxide within the blood.</td>
</tr>
<tr>
<td>Hormones</td>
<td>Cells which act to defend the human body against pathogens and foreign invaders.</td>
</tr>
<tr>
<td>Nervous system</td>
<td>Filtering structural unit located in the kidney that removes waste matter from the blood.</td>
</tr>
<tr>
<td>Fertilization</td>
<td>Maintaining a stable environment within an organism.</td>
</tr>
<tr>
<td>Antigen</td>
<td>A water-soluble by-product of metabolism that is filtered out by the kidneys and excreted as urine.</td>
</tr>
<tr>
<td>Red blood cells</td>
<td>Made up of millions of nerve cells that respond to external stimuli or changes from the outside environment.</td>
</tr>
<tr>
<td>White blood cells</td>
<td>Chemical substances that transmit nerve impulses across a synapse.</td>
</tr>
<tr>
<td>Glands</td>
<td>An agent that causes disease, especially a living microorganism such as bacteria and virus.</td>
</tr>
<tr>
<td>Urea</td>
<td>A substance (foreign protein) that when introduced into the body stimulates the production of an antibody; these substances are found in toxins, bacteria, cells of transplanted organs, etc.</td>
</tr>
<tr>
<td>Nephron</td>
<td>Chemical messengers that are produced and secreted by glands into the bloodstream where they travel to target cells to illicit a response.</td>
</tr>
<tr>
<td>Homeostasis</td>
<td>Hormones produced by the ovary that are responsible for maintaining the uterus.</td>
</tr>
<tr>
<td>Pathogen</td>
<td>The union of male and female gametes to form a zygote. This occurs in the fallopian tube (oviduct).</td>
</tr>
<tr>
<td>Neurotransmitters</td>
<td>Groups of tissues that secrete specific hormones.</td>
</tr>
<tr>
<td>Estrogen and Progesterone</td>
<td>A system of organs involved in the removal of harmful waste as well as to maintain water balance.</td>
</tr>
</tbody>
</table>
Vocabulary Refresher

Group C  Directions - Match the correct definition for the following terms:

1. K. Vaccines
   - A. Membrane proteins that bind with specific molecules to produce a cellular response.

2. F. Feedback
   - B. The bodily system that consists of glands and the hormones that they secrete.

3. I. B cells
   - C. Cells that contain specific receptors that will bind with specific hormones to produce a specific reaction.

4. A. Receptor proteins
   - D. A hormone produced by the pancreas that allows cells to take in sugar, thus regulating blood sugar levels.

5. M. Synapse
   - E. The organ that produces the hormones, estrogen and progesterone, which are involved in female reproductive development as well as promotes gamete (egg) formation.

6. B. Endocrine system
   - F. A mechanism that allows for the regulation of hormones or body temperature levels by increasing or decreasing activity within that system.

7. L. Memory cells
   - G. A hormone that is produced primarily in the testes and is responsible for the development of male sex characteristics.

8. D. Insulin
   - H. A system that is involved in the defense of the human body through action of white blood cells.

9. C. Target cells
   - I. Type of white blood cells that produce plasma cells which release antibodies.

10. G. Testosterone
    - J. Type of white blood cells that directly attack pathogen-infected cells and serve to activate other white blood cells.

11. N. Differentiation
    - K. Contain weakened pathogens that create an immunity to that particular pathogen.

12. J. T cells
    - L. T and B cells that have receptors to recognize previous pathogens and readily begin an immune response.

13. H. Immune system
    - M. The junction at which a nerve impulse passes across from one nerve to another.

14. E. Ovary
    - N. A process that occurs after rapid cell division of the zygote where cells begin to develop different functions based on gene expression.
Vocabulary Refresher

Group D  Directions - Match the correct definition for the following terms:

1. ______ Umbilical cord
   A. An condition in which the body produces an immune response to a normally harmless substance, like pollen.

2. ______ Fetus
   B. Secreted in response to antigens, they have receptor molecules that can bind to antigens or infected cells marking them for destruction.

3. ______ Uterus
   C. A virus that weakens the immune system by destroying T cells.

4. ______ Allergic reaction
   D. A severe immunological disorder caused by the HIV virus where the human immune system is weakened and compromised.

5. ______ HIV
   E. A pair of slender ducts through which the egg passes from the ovaries to the uterus in the female reproductive system.

6. ______ Menstrual cycle
   F. A flexible cord-like structure that connects the fetus to the placenta; it transports nourishment, gases, and waste products via the arteries and veins found within.

7. ______ Antibodies
   G. Where sperm cells mature and are stored.

8. ______ Fallopian tubes
   H. Formed when the sperm and egg unite – has a full set of chromosomes.

9. ______ Embryo
   I. A membranous organ that provides a means of exchange for nutrients, wastes, and gases between the developing fetus and mother.

10. ______ Zygote
    J. A developing baby after 8 weeks.

11. ______ AIDS
    K. This recurring monthly occurrence in women regulates reproduction by releasing an egg produced in the process known as ovulation.

12. ______ Testes
    L. A developing baby up to 8 weeks of life.

13. ______ Vas deferens
    M. A muscular organ located in the pelvic cavity of females in which the fertilized egg implants and develops.

14. ______ Placenta
    N. Male organs where the process of sperm production takes place through the process of meiosis.
1. Which situation indicates that a disruption of homeostasis has taken place?
   (1) the presence of hormones that keep the blood sugar level steady
   (2) the maintenance of a constant body temperature
   (3) cell division that is involved in normal growth
   (4) a rapid rise in the number of red blood cells

2. A human liver cell is very different in structure and function from a nerve cell in the same person. This is best explained by the fact that
   (1) different genes function in each type of cell
   (2) liver cells can reproduce while the nerve cells cannot
   (3) liver cells contain fewer chromosomes than nerve cells
   (4) different DNA is present in each type of cell

3. Which substances may form in the human body due to invaders entering the blood?
   (1) nutrients
   (2) vaccines
   (3) antibodies
   (4) red blood cells

4. A protein on the surface of HIV can attach to proteins on the surface of healthy human cells. These attachment sites on the surface of the cells are known as
   (1) receptor molecules
   (2) genetic codes
   (3) molecular bases
   (4) inorganic catalysts

5. To communicate between cells, many multicellular animals use
   (1) nerve signals and respiratory gases
   (2) respiratory gases and hormones
   (3) bones and muscles
   (4) nerve signals and hormones

6. Cellular communication is illustrated in the diagram below.

   _____________  ______________
   _____________  ______________
   _____________  ______________
   _____________  ______________

   Information can be sent from
   (1) cell A to cell B because cell B is able to recognize signal 1
   (2) cell A to cell B because cell A is able to recognize signal 2
   (3) cell B to cell A because cell A is able to recognize signal 1
   (4) cell B to cell A because cell B is able to recognize signal 2

7. Which activity would stimulate the human immune system to provide protection against an invasion by a microbe?
   (1) receiving antibiotic injections after surgery
   (2) choosing a well-balanced diet and following it throughout life
   (3) being vaccinated against chicken pox
   (4) receiving hormones contained in mother's milk while nursing

8. Which developmental process is represented by the diagram below?

   _____________  ______________
   _____________  ______________
   _____________  ______________
   _____________  ______________

   (1) fertilization
   (2) differentiation
   (3) evolution
   (4) mutation

Page 160 Set 1 — Human Physiology, Reproduction, and Homeostasis
9. The diagram below represents one metabolic activity of a human.

Metabolic Activity A

[Diagram with arrows and labels]

Protein

Letters A and B are best represented by which row in the chart?

<table>
<thead>
<tr>
<th>Row</th>
<th>Metabolic Activity A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>respiration</td>
<td>oxygen molecules</td>
</tr>
<tr>
<td>(2)</td>
<td>reproduction</td>
<td>hormone molecules</td>
</tr>
<tr>
<td>(3)</td>
<td>excretion</td>
<td>simple sugar molecules</td>
</tr>
<tr>
<td>(4)</td>
<td>digestion</td>
<td>amino acid molecules</td>
</tr>
</tbody>
</table>

10. Contractile vacuoles maintain water balance by pumping excess water out of some single-celled pond organisms. In humans, the kidney is chiefly involved in maintaining water balance. These facts best illustrate that

(1) tissues, organs, and organ systems work together to maintain homeostasis in all living things
(2) interference with nerve signals disrupts cellular communication and homeostasis within organisms
(3) a disruption in a body system may disrupt the homeostasis of a single-celled organism
(4) structures found in single-celled organisms can act in a manner similar to tissues and organs in multicellular organisms

11. Certain microbes, foreign tissues, and some cancerous cells can cause immune responses in the human body because all three contain

(1) antigens
(2) enzymes
(3) fats
(4) cytoplasm

12. Which statement best describes how a vaccination can help protect the body against disease?

(1) Vaccines directly kill the pathogen that causes the disease.
(2) Vaccines act as a medicine that cures the disease.
(3) Vaccines cause the production of specific molecules that will react with and destroy certain microbes.
(4) Vaccines contain white blood cells that engulf harmful germs and prevent them from spreading throughout the body.

13. An important method of communication between cells in an organism is shown in the diagram.

What is the chemical referred to in the diagram?

(1) a hormone important in maintaining homeostasis
(2) an enzyme detected a cell membrane receptor
(3) DNA necessary regulating cell functions
(4) a food molecule taken in by an organism

14. The human reproductive system is regulated by

(1) restriction enzymes
(2) antigens
(3) complex carbohydrates
(4) hormones
15. Which statement describes a feedback mechanism involving the human pancreas?

(1) The production of estrogen stimulates the formation of gametes for sexual reproduction.
(2) The level of oxygen in the blood is related to heart rate.
(3) The level of sugar in the blood is affected by the amount of insulin in the blood.
(4) The production of urine allows for excretion of cell waste.  

16. In the human pancreas, acinar cells produce digestive enzymes and beta cells produce insulin. The best explanation for this is that

(1) a mutation occurs in the beta cells to produce insulin when the sugar level increases in the blood
(2) different parts of an individual’s DNA are used to direct the synthesis of different proteins in different types of cells
(3) lowered sugar levels cause the production of insulin in acinar cells to help maintain homeostasis
(4) the genes in acinar cells came from one parent while the genes in beta cells came from the other parent

17. Which process normally occurs at the placenta?

(1) Oxygen diffuses from fetal blood to maternal blood.
(2) Materials are exchanged between fetal and maternal blood.
(3) Maternal blood is converted into fetal blood.
(4) Digestive enzymes pass from maternal blood to fetal blood.

18. Structures in a human female are represented in the diagram. A heavy dose of radiation would have the greatest impact on genetic information in future offspring if it reached gametes developing within structure

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

19. Some body structures of a human male are represented in the diagram. An obstruction in the structures labeled X would directly interfere with the

(1) transfer of sperm to a female  
(2) production of sperm  
(3) production of urine  
(4) transfer of urine to the external environment

20. The diagram below represents human reproductive systems.

Which statement best describes part of the human reproductive process?

(1) Testosterone produced in A is transferred to D, where it influences embryonic development.
(2) Testosterone produced in D influences formation of sperm within B.
(3) Estrogen and progesterone influence the activity of C.
(4) Progesterone stimulates the division of the egg within C.
Base your answer to question 58 on the information below.

Immunization protects the human body from disease. The success of vaccinations can be seen in the fact that smallpox has been eliminated worldwide from the list of common infectious diseases. The only remaining smallpox viruses on Earth are thought to be those kept in certain research laboratories. The United States is now committed to the goal of immunizing all children against common childhood diseases. However, many parents are choosing not to immunize their children against childhood diseases such as diphtheria, whooping cough, and polio. For example, the mother of a newborn baby is concerned about having her child receive the DPT (diphtheria, whooping cough, and tetanus) vaccine. Since these diseases are caused by bacteria, she believes antibiotic therapy is a safe alternative to vaccination.

58. Discuss the use of antibiotics and vaccines in the treatment and prevention of bacterial diseases. In your answer be sure to include:

a) what is in a vaccine "dead or weakened bacteria"

b) how a vaccine promotes immunity "stimulates antibody production"

c) one advantage of the use of vaccinations to fight bacterial diseases "usually, you will not get the disease. Vaccinations provide immunity that lasts a long time."

d) one disadvantage of the use of antibiotics to fight bacterial diseases "do not provide protection against future attacks OR bacteria may become resistant"

59. Consuming large volumes of soft drinks containing sugar during the day can disrupt homeostasis. Describe how the human body responds to restore sugar balance. In your answer, be sure to:

a) identify the hormone responsible for restoring homeostasis "insulin"

b) identify the organ that releases this hormone "pancreas"

c) state one possible reason why sugar levels may remain high even though this hormone has been released "not enough insulin is released OR the person has diabetes OR there are not many insulin receptors"

60. Explain how the change in heart rate helps to maintain homeostasis during exercise.

- HR ↑, which transports more O₂ from the lungs to muscle cells.
- The heart beats faster & transports CO₂ to the lungs faster for elimination.
- HR removes wastes from cells more rapidly.

61. Identify the relationship that exists between a virus and a human when the virus infects the human.

"parasite-host"
Base your answers to question 62 on the information below.

Human reproduction is influenced by many different factors.

62. a) Identify one reproductive hormone and state the role it plays in reproduction.

Hormone: **Testosterone, Estrogen, Progesterone**

Role: ________________

b) Identify the structure in the uterus where the exchange of material between the mother and the developing fetus takes place.

Placenta

c) Identify one harmful substance that can pass through this structure and describe the negative effect it can have on the fetus.

Substance: **Drugs, alcohol, nicotine, viruses (such as HIV)**

Negative effect: **Fetal addiction, low birth weight, premature birth, brain damage, fetal alcohol syndrome, disease can cross placenta to fetus.**

Base your answers to question 63 on the passage below.

When humans perspire, water, urea, and salts containing sodium are removed from the blood. Drinking water during extended periods of physical exercise replenishes the water but not the sodium. This increase in water dilutes the blood and may result in the concentration of sodium dropping low enough to cause a condition known as hyponatremia. Symptoms of hyponatremia include headache, nausea, and lack of coordination. Left untreated, it can lead to coma and even death. The body has a variety of feedback mechanisms that assist in regulating water and sodium concentrations in the blood. The kidneys play a major role in these mechanisms, as they filter the blood and produce urine.

63. a) Many runners pour water on their bodies during a race. Explain how this action helps to maintain homeostasis. **Reduces loss of sodium or cools the body or decreases amount of perspiration or slows down water loss or reduces the chances of hyponatremia.**

b) How would running in a marathon on a warm day most likely affect urine production?

Support your answer.

Urine production: **Becomes less**

Supporting statement: **Less urine will be produced because lots of water is lost in sweat - other answers acceptable.**

c) Many people today drink sport drinks containing large amounts of sodium. Describe one possible effect this might have on a person who is not very active.

It could raise their blood pressure or it could cause them to retain water or it could decrease urine production.