1. Base your answer to the following question on the diagram below and on your knowledge of biology. Each arrow in the diagram represents a different hormone released by the pituitary gland that stimulates the gland indicated in the diagram. All structures are present in the same organism.

Why does hormone 1 influence the action of gland $A$ but not gland $B$ or $C$?

A) Every activity in gland $A$ is different from the activities in glands $B$ and $C$
B) The cells of glands $B$ and $C$ contain different receptors than the cells of gland $A$
C) Each gland contains cells that have different base sequences in their DNA.
D) The distance a chemical can travel is influenced by both pH and temperature.

2. Pregnancy, which is characteristically associated with changes in hormone levels in the body is a process tightly regulated by

A) the endocrine and nervous system
B) the reproductive system
C) the circulatory and respiratory system
D) the digestive system

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

A) sugar  B) hormone
C) DNA  D) cell

4. After a hormone enters the bloodstream, it is transported throughout the body, but the hormone affects only certain cells. Only certain cells are affected because the membranes of these cells have what specific structures?

A) receptors  B) tissues
C) antibodies  D) carbohydrates

5. An increase in the level of insulin in the blood would most directly result in

A) a decrease in the amount of glucose in the blood
B) a decrease in the amount of protein in the blood
C) an increase in the amount of fat in cells
D) an increase in the amount of carbon dioxide in cells
6. The diagram below represents an interaction between parts of an organism.

The term *chemicals* in this diagram represents
A) starch molecules  B) DNA molecules  
C) hormone molecules  D) receptor molecules

Base your answers to questions 7 and 8 on the diagram below and on your knowledge of biology. The arrows in the diagram indicate certain hormones in the human male body.

7. Which activity would most likely be a function of hormone 3?
A) stimulating the body tissues to produce secondary sex characteristics  
B) causing the thyroid to produce thyroxin  
C) increasing the blood-sugar level  
D) promoting the conversion of body fat into glycogen

8. A high level of hormone 3 in the blood inhibits the production of hormone 2. This situation is an example of
A) nervous regulation  B) hydrolysis  
C) deamination  D) negative feedback

9. Which hormone stimulates the release of sugar from the liver into the blood?
A) parathormone  B) insulin  
C) glucagon  D) FSH

10. Gland A releases a hormone that causes gland B to release estrogen. Gland A is most likely the
A) testis  B) pituitary  
C) thyroid  D) ovary

11. Base your answer to the following question on the diagram below of some human digestive organs and on your knowledge of biology.

Which organ secretes digestive enzymes and the hormones insulin and glucagon?
A) A  B) B  C) C  D) D

12. Pituitary growth hormone can affect cells in various parts of the human body because the hormone is secreted directly into
A) glandular ducts  B) muscle tissue  
C) the bloodstream  D) the digestive tract

13. An increase in the level of hormone A causes an increase in the level of hormone B. The increase in the level of hormone B then causes a decrease in the level of hormone A. This process is an example of
A) a failure to maintain homeostasis  B) the breakdown of chemicals  
C) a disruption in cellular coordination  D) a feedback mechanism

14. Diabetes is a disease associated with extremely low levels of insulin, a hormone which controls sugar levels in the blood. People with diabetes would be considered to have malfunctions in which human system?
A) Endocrine  B) Circulatory  
C) Respiratory  D) Reproductive
15. The chart below represents a homeostatic control mechanism in humans.

![Chart Image]

Which system is most directly involved in the events represented in the chart?

A) digestive  
B) endocrine  
C) nervous  
D) respiratory

16. The diagram below represents the actions of two hormones in the human body.

![Diagram Image]

This diagram best illustrates

A) recombination  
B) feedback  
C) insertion  
D) deletion

17. The most immediate response to a high level of blood sugar in a human is an increase in the

A) muscle activity in the arms  
B) blood flow to the digestive tract  
C) activity of all cell organelles  
D) release of insulin

18. Which statement describes a feedback mechanism involving the human pancreas?

A) The production of estrogen stimulates the formation of gametes for sexual reproduction.  
B) The level of oxygen in the blood is related to heart rate.  
C) The level of sugar in the blood is affected by the amount of insulin in the blood.  
D) The production of urine allows for excretion of cell waste.

Base your answers to questions 19 and 20 on the information below and on your knowledge of biology.

Diabetes is a condition characterized by elevated blood sugar levels. One form of diabetes occurs when insulin fails to properly regulate blood sugar levels. Complications from diabetes can include nerve cell damage and poor blood flow, especially in the feet and legs. In individuals with diabetes, wounds usually take longer than normal to heal.

19. One reason for the change in wound healing time in a diabetic is that

A) elevated hormone levels block the synthesis of glucose in immune cells  
B) nerve damage increases absorption of glucose by healthy cells  
C) poor circulation reduces the supply of nutrients and oxygen to the cells  
D) decreased enzyme production slows protein synthesis in pancreatic cells

20. The failure of a cell to react in a normal manner to insulin is most likely the result of a problem with

A) vacuoles  
B) receptors  
C) mitochondria  
D) sugars

21. What will most likely result if a diabetic injects an overdose of insulin?

A) a serious infection in the pancreas  
B) an increase in the production of pancreatic enzymes  
C) an accumulation of wastes in the bloodstream  
D) a dangerous drop in blood sugar levels
22. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents the effect of two chemical substances, $A$ and $B$, in maintaining the level of glucose in the blood in humans.

Which statement is correct regarding the substances involved in these interactions?

A) Substance $A$ is insulin, which is released by cells in the pancreas.
B) Substance $B$ is a chemical receptor molecule produced by blood cells.
C) Both substances $A$ and $B$ are classified as biological catalysts.
D) Substance $A$ is a chemical that is produced by specialized blood cells.

Base your answers to questions 23 and 24 on the information below and on your knowledge of biology.

Cell communication involves a cell detecting and responding to signals from other cells. Receptor molecules play an important role in these reactions. Human cells have insulin receptors that are needed for the movement of glucose out of the blood.

23. A typical human liver cell can have over 90,000 insulin receptors. If a genetic error occurred, resulting in each liver cell in a person having only 1,000 insulin receptors, what specific effect would this have on the liver cells?

24. State one way that the shape of the insulin receptor is related to its role in cell communication.
25. Explain why cell A is a nontarget cell for the hormone illustrated in the diagram.

26. Letter B indicates:

A) ribosomes  
B) receptor molecules  
C) tissues  
D) inorganic substances

Base your answers to questions 27 and 28 on the diagram below of activities in the human body.

27. Identify one hormone involved in another biological relationship and an organ that is directly affected by the hormone you identified.

28. Describe the action represented by the arrow labeled X in the diagram and state one reason that this action is important.
29. Which graph of blood sugar level over a 12-hour period best illustrates the concept of dynamic equilibrium in the body?

A) ![Graph A]

B) ![Graph B]

C) ![Graph C]

D) ![Graph D]

30. Base your answer to the following question on The diagram below represents a function of the thyroid gland.

State one effect of an increasing level of TSH-releasing factor.
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Name ____________________  Class ____________________  Date _________