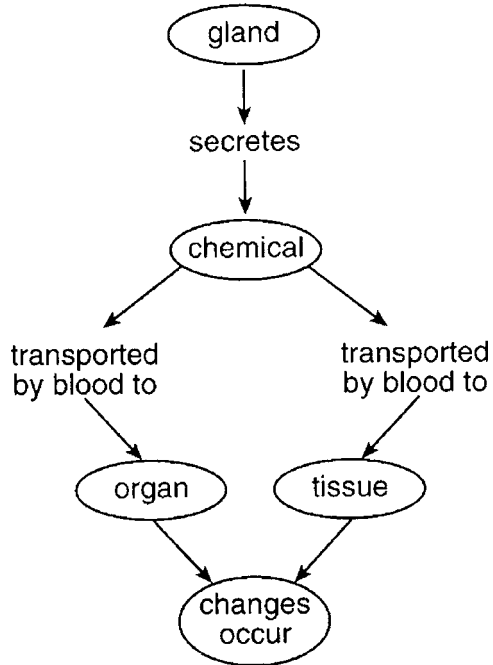


Genetics Practice Examination #2

Name: _____

Date: _____

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



What is the chemical referred to in the diagram?

- A. a hormone important in maintaining homeostasis
- B. an enzyme detected by a cell membrane receptor
- C. DNA necessary for regulation cell functions
- D. a food molecule taken in by an organism

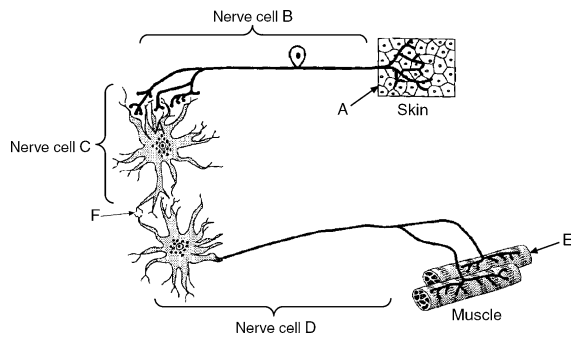
2. In multicellular organisms, cells must be able to communicate with each other. Structures that enable most cells to communicate with each other are known as

- A. pathogenic agents
- B. chloroplasts
- C. antibiotics
- D. receptor molecules

3. Communication between cells is affected if there is decreased ability to produce

- A. digestive enzymes and gametes
- B. antibodies and chloroplasts
- C. hormones and nerve impulses
- D. antibiotics and guard cells

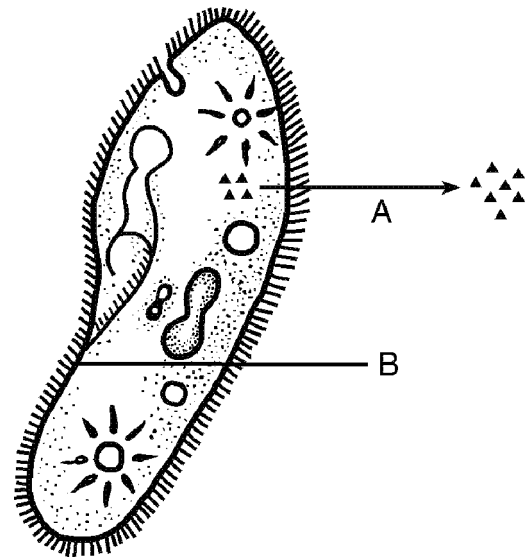
4. Base your answer(s) to the following question(s) on the diagram illustrating one type of cellular communication and on your knowledge of biology.



In region *F*, there is a space between nerve cells *C* and *D*. Cell *D* is usually stimulated to respond by

- a chemical produced by cell *C* moving to cell *D*
- the movement of a virus from cell *C* to cell *D*
- the flow of blood out of cell *C* to cell *D*
- the movement of material through a blood vessel that forms between cell *C* and cell *D*

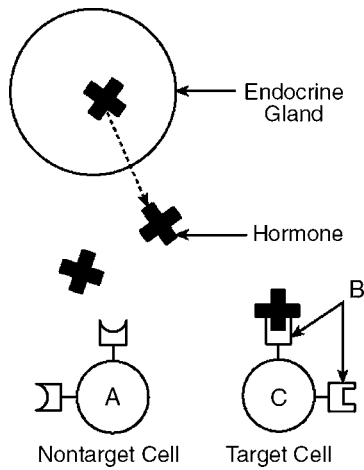
5. Base your answer(s) to the following question(s) on the diagram, which represents a unicellular organism in a watery environment. The ▲'s represent molecules of a specific substance.



In cells of multicellular organisms, structure *B* often contains molecules involved in cell communication. What specific term is used to identify these molecules?

- Hormones and secretions of the nervous system are chemical messengers that
 - store genetic information
 - carry out the circulation of materials
 - extract energy from nutrients
 - coordinate system interactions

7. Base your answer(s) to the following question(s) on the diagram below which illustrates a role of hormones.

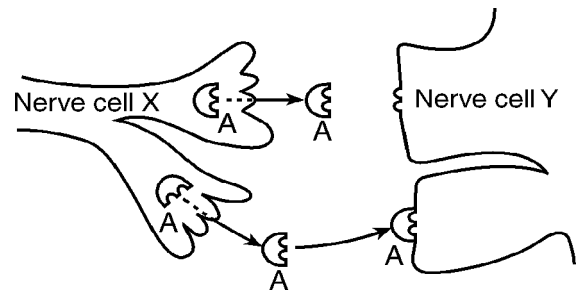


Letter *B* indicates

- A. ribosomes
- B. receptor molecules
- C. tissues
- D. inorganic substances

8. Explain why cell *A* is a nontarget cell for the hormone illustrated in the diagram.

9. Base your answer(s) to the following question(s) on the diagram below and on your knowledge of biology.



The process represented in the diagram best illustrates

- A. cellular communication
- B. muscle contraction
- C. extraction of energy from nutrients
- D. waste disposal

10. Which statement best describes the diagram?

- A. Nerve cell *X* is releasing receptor molecules.
- B. Nerve cell *Y* is signaling nerve cell *X*.
- C. Nerve cell *X* is attaching to nerve cell *Y*.
- D. Nerve cell *Y* contains receptor molecules for substance *A*.

11. 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?



12. Base your answer(s) to the following question(s) 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.

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?

13. State one way that the shape of the insulin receptor is related to its role in cell communication.

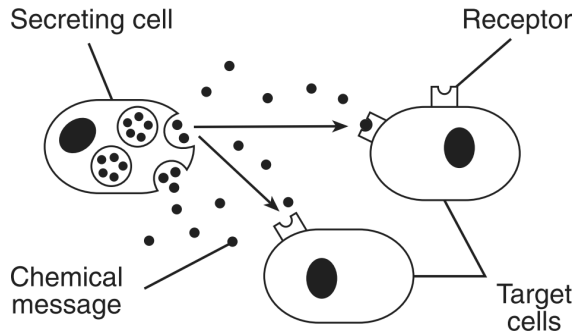
14. Which substances are found on cell surfaces and respond to nerve and hormone signals?

- A. starches and simple sugars
- B. subunits of DNA
- C. vitamins and minerals
- D. receptor molecules

15. After a hormone enters the bloodstream, it is transported throughout the body, but the hormone affects only certain cells. The reason only certain cells are affected is that the membranes of these cells have specific

- A. receptors
- B. tissues
- C. antibodies
- D. carbohydrates

16. 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

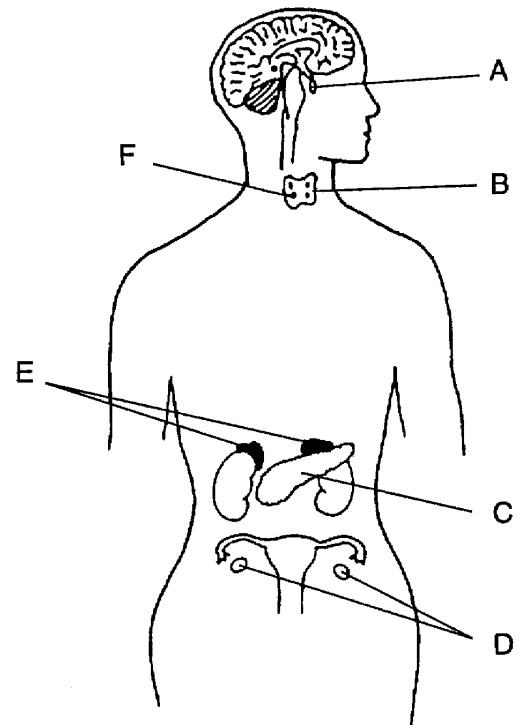
- A. produce their own chemical messages
 B. not respond with appropriate actions
 C. develop different receptors
 D. no longer be produced in the organism
17. Which statement concerning cell communication is correct?

- A. DNA codes for certain molecules that become cell receptors involved in cell communication.
 B. Cells produce ATP molecules, which become cell receptors for communication.
 C. Cells build new cell parts, which function as communication genes.
 D. Certain proteins use cell communication to build new cell parts made of DNA.

18. How do cells in the ovary detect a hormone from the brain?

- A. The brain sends a nerve impulse to the ovary.
 B. White blood cells bring the hormone to the ovary.
 C. Receptor molecules on the cells of the ovary bind with the hormone.
 D. Vacuoles within the ovary bind with the hormone.

19. Shown is a diagram of the endocrine system. A hormone that increases the rate and strength of heart contractions during times of sudden stress is secreted by

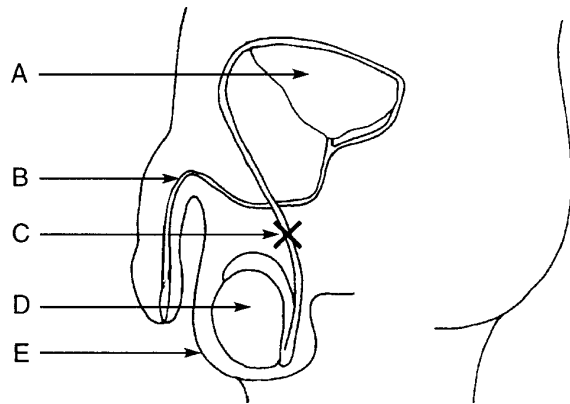


- A. A B. E C. F D. D

20. The part of the male reproductive system that provides an optimum temperature for sperm production is the

- A. testis
- B. scrotum
- C. urethra
- D. penis

21. Base your answer(s) to the following question(s) on the diagram below and on your knowledge of biology.



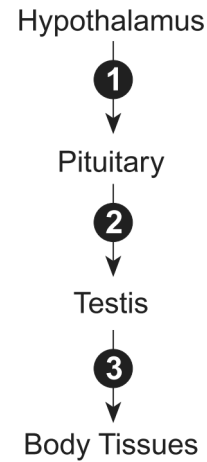
Which structure is part of both the reproductive and excretory systems?

- A. E
- B. B
- C. C
- D. D

22. 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

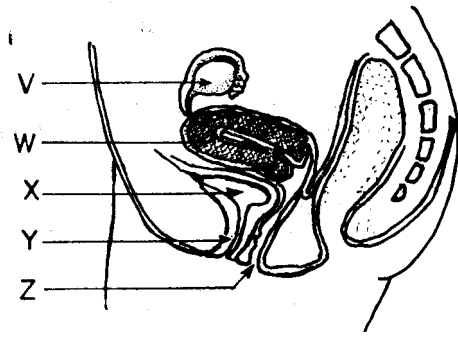
23. Base your answer(s) to the following question(s) on the diagram below and on your knowledge of biology. The arrows in the diagram indicate certain hormones in the human male body.



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

24. Shown is a diagram of some anatomical organs of a human female.



Sperm cells are normally deposited in the structure represented by

- A. Z B. Y C. X D. V

25. An ovum is produced in the structure represented by

- A. X B. Y C. V D. W

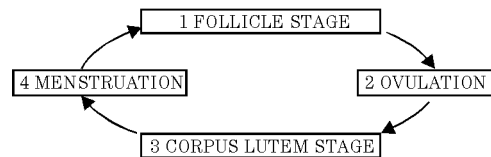
26. The reproductive tube known as the oviduct would normally be located between structures

- A. Y and Z B. X and Y
C. V and W D. W and Z

27. The liquid that contains male gametes and secretions from glands of the human male reproductive system is known as

- A. sperm B. testosterone
C. progesterone D. semen

28. The diagram shown represents the stages of the menstrual cycle. This cycle is regulated by the interaction hormones from the



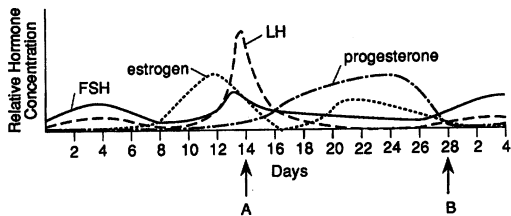
- A. pituitary, thyroid, and adrenal
B. thyroid, adrenal, and pancreas
C. pancreas, ovaries, and parathyroid
D. hypothalamus, pituitary, and ovaries

29. Some women are unable to have children because of a blockage in the portion of their reproductive tract where fertilization of the egg cell would normally occur. In vitro fertilization is a technique that had been developed to make it possible for such women to bear their own children. This technique involves fertilizing an egg in a sterile petri dish environment and then implanting the developing embryo into the mother.

To ensure that a woman will have mature egg cells available for in vitro fertilization, she is treated with hormones from the

- A. pituitary gland B. pancreas
C. parathyroid gland D. thyroid gland

30. The graph shows the different concentrations of female reproductive hormones during the menstrual cycle of humans.



Answer the following question(s) based on the graph shown and on your knowledge of biology.

Which process usually begins at *B*?

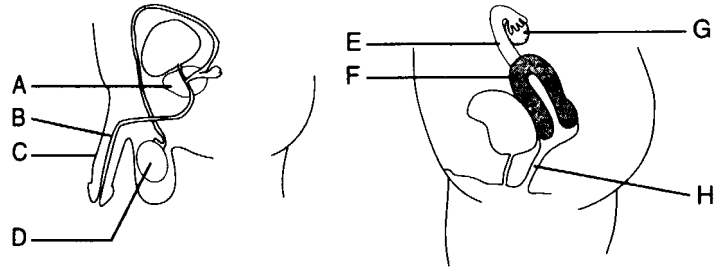
- A. fertilization
B. embryo development
C. corpus luteum development
D. menstruation

31. Which is a correct inference about an event that occurs prior to day 14?

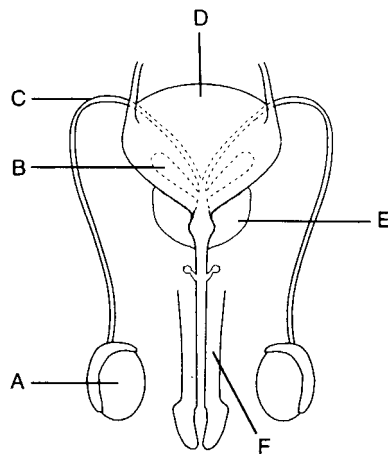
- A. A high level of estrogen may stimulate the production of LH.
B. A high level of LH may stimulate the production of FSH.
C. A low level of FSH inhibits the production of estrogen.
D. A low level of progesterone inhibits the production of estrogen.

32. Which structure produces and secretes a liquid transport medium that is known as semen when it contains sperm?

- A. A B. B C. F D. D



33. Structure A is considered part of both the reproductive system and the



- A. circulatory system B. excretory system
C. digestive system D. endocrine system

34. When compared with the number of gametes produced from a single human primary sex cell during oogenesis, the number of gametes produced from a single human primary sex cell during spermatogenesis is usually

- A. four times as great B. twice as great
C. half as great D. the same

35. For each statement in the following question(s), select the stage of the human menstrual cycle, chosen from the list below, that is most closely associated with that statement.

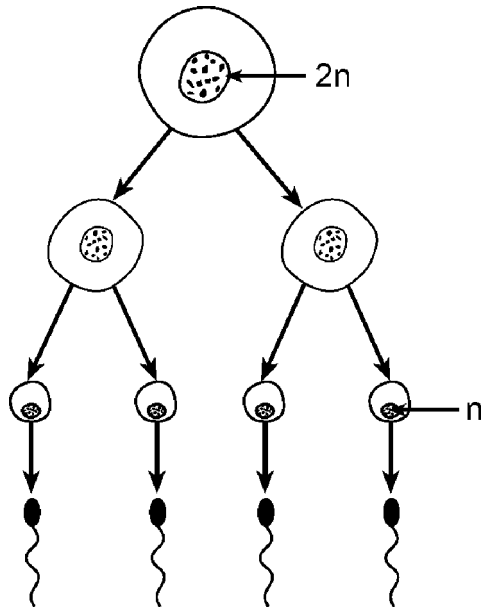
Stages of the Human Menstrual Cycle

- (1) Follicle
- (2) Ovulation
- (3) Corpus luteum
- (4) Menstruation

It is characterized by a yellow-bodied structure that secretes the hormone progesterone.

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

36. Base your answer(s) to the following question(s) on the diagram below, which represents a necessary part of human reproduction, and on your knowledge of biology.



This diagram represents the process of

- A. ovulation
- B. gastrulation
- C. mitotic cell division
- D. gametogenesis

37. Which sequence best represents the order of the stages in the menstrual cycle?

- A. D → B → C → A
- B. A → B → D → C
- C. C → A → B → D
- D. A → B → C → D

Stages of the Menstrual Cycle

Stage	Event
A	Periodic shedding of the thickened uterine lining
B	Release of the egg
C	Production of progesterone by tissue in a follicle
D	Maturation of the egg and secretion of estrogen

38. Which structure does the egg that is released in stage B normally enter first?

A. cervix

B. vagina

C. uterus

D. oviduct