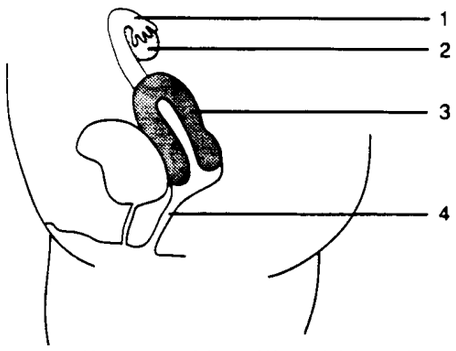
1. The immune system of humans may respond to chemicals on the surface of an invading organism by

   A) releasing hormones that break down these chemicals
   B) synthesizing antibodies that mark these organisms to be destroyed
   C) secreting antibiotics that attach to these organisms
   D) altering a DNA sequence in these organisms

2. Base your answer to the following question on the part of the human female reproductive tract, Chosen from the diagram below, that is best described by that statement.



   Following ovulation, the egg is normally moved by cilia within this structure.

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

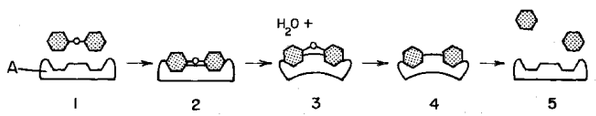
3. Asexual reproduction primarily involves the process of

   A) ovulation B) pollination
   C) mitosis D) spermatogenesis

4. A person with AIDS is likely to develop infectious diseases because the virus that causes AIDS

   A) destroys cancerous cells B) damages the immune system
   C) increases the rate of antibody production D) increases the rate of microbe destruction

5. Base your answer to the following question on the diagram below which represents steps in the enzyme-catalyzed breakdown of maltose and on your knowledge of biology.



   Steps 1 through 5 best illustrate

   A) that substrate concentration affects enzyme action
   B) a model of enzyme specificity
   C) that enzymes are composed of protein
   D) the role of coenzymes in chemical reactions

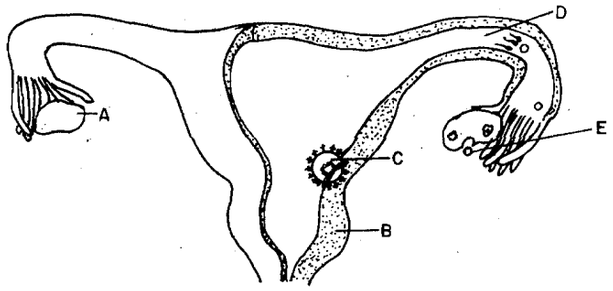
6. Which statement about enzymes is *not* correct?

   A) Enzymes are composed of polypeptide chains.
   B) Enzymes form a temporary association with a reactant.
   C) Enzymes are destroyed when they are used and must be synthesized for each reaction.
   D) Enzymes are specific because of their shape and catalyze only certain reactions.

7. In which stage of the human menstrual cycle is an egg released from an ovary?

   A) Ovulation B) Follicle stage
   C) Menstruation D) Corpus luteum stage

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



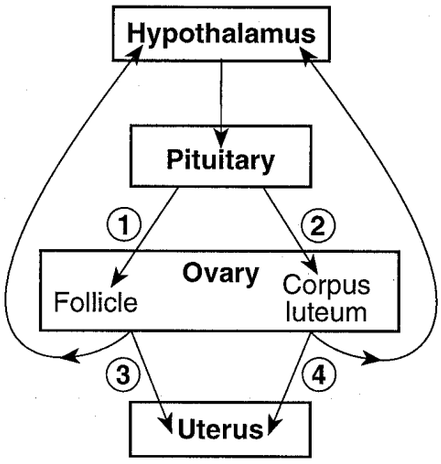
What event is occurring at *E*?

A) sperm production
B) menstruation
C) ovulation
D) gastrulation

9. In humans, the first structure to receive an egg following ovulation is normally the

A) testis
B) uterus
C) vagina
D) oviduct

10. Base your answer to the following question on the diagram below and on your knowledge of biology. The arrows in the diagram show the interrelationships between the hormones and the structures involved in the menstrual cycle. Specific hormones are indicated by numbers.



Which hormone maintains the uterine lining after ovulation?

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

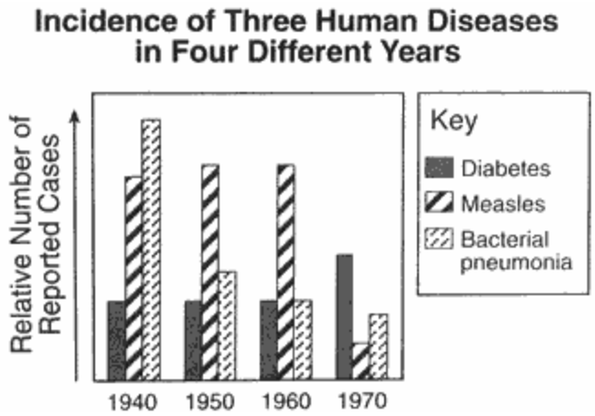
11. The purpose of introducing weakened microbes into the body of an organism is to stimulate the

A) production of living microbes that will protect the organism from future attacks
B) production of antigens that will prevent infections from occurring
C) immune system to react and prepare the organism to fight future invasions by these microbes
D) replication of genes that direct the synthesis of hormones that regulate the number of microbes

12. A temporary suspension of the menstrual cycle normally occurs during

A) menstruation
B) pregnancy
C) ovulation
D) menopause

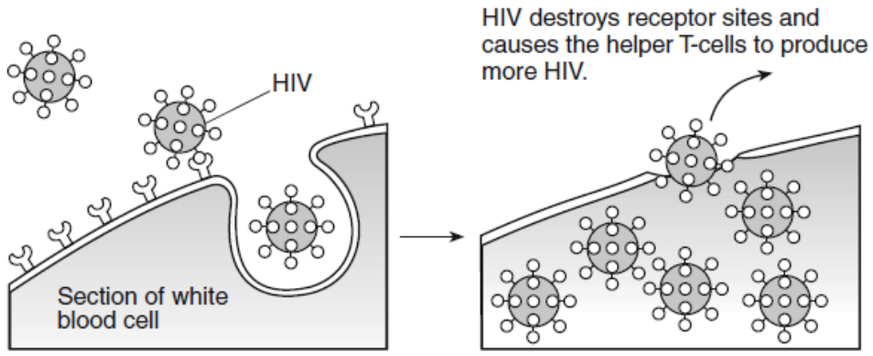
13. Base your answer to the following question on the graph below.



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

A) Children were vaccinated against measles.
B) New drugs cured diabetes.
C) The bacteria that cause pneumonia developed a resistance to drugs.
D) New technology helped to reduce the incidence of all three diseases.

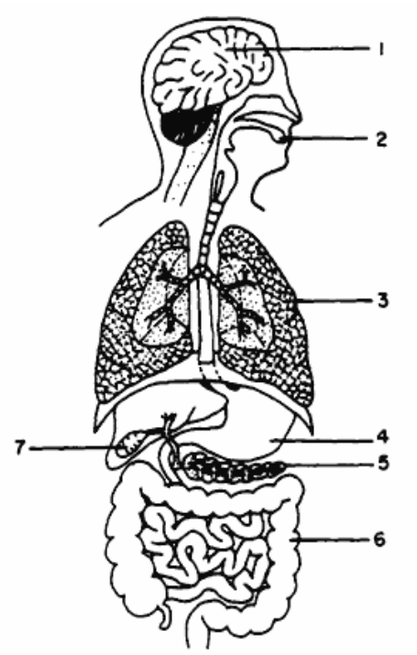
14. The diagram below represents how HIV, the virus that causes AIDS, interacts with a certain type of white blood cell called a helper T-cell.



What is one possible result of the cellular activity represented in the diagram?

A) Immune responses of an infected individual will be weakened.
B) The red blood cells of a person infected with AIDS will no longer be able to make antibodies.
C) This virus will strengthen future immune responses against blood-related diseases.
D) Immune responses will prevent the spread of AIDS in humans.

15. Base your answer to the following question on the organ, indicated in the diagram below, that is most closely associated with that statement.



Diabetes may result from an insufficient production of insulin by this organ.

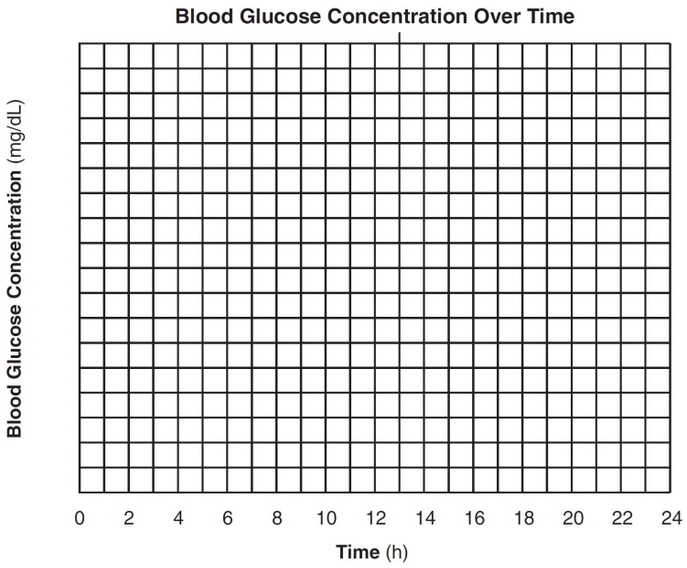
A) 3 B) 4 C) 5 D) 6 E) 7

16. Base your answer to the following question on the information below and on your knowledge of biology.

In a test for diabetes, blood samples were taken from an individual every 4 hours for 24 hours. The glucose concentrations were recorded and are shown in the data table below.

Blood Glucose Level Over Time

Time (h)	Blood Glucose Concentration (mg/dL)
0	100
4	110
8	128
12	82
16	92
20	130
24	104



The chemical that is responsible for the *decrease* in blood glucose concentration is released by

A) muscle cells B) guard cells C) the ovaries D) the pancreas

17. The presence of lactic acid in the cells of an animal's muscle tissue is an indication that the

A) animal is not adapted to the use of glucose
B) number of mitochondria in the muscle cells has increased
C) animal carries on a complex form of respiration during daylight hours
D) muscle cells have been active during a period of oxygen deficiency

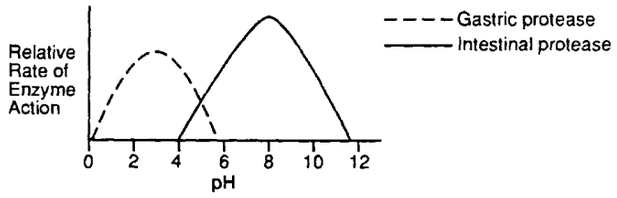
18. A marathon runner frequently experiences muscle cramps while running. If he stops running and rests, the cramps eventually go away. The cramping in the muscles most likely results from

A) lack of adequate oxygen supply to the muscle
B) the runner running too slowly
C) the runner warming up before running
D) increased glucose production in the muscle

19. In the transfer of energy from the Sun to ecosystems, which molecule is one of the first to store this energy?

A) protein B) fat C) DNA D) glucose

Base your answers to questions **20** and **21** on the graph below and on your knowledge of biology.



20. Which is a true statement about the relationship of pH and enzyme action

A) All enzymes work best at a neutral pH.
B) Adding more acid does not affect the rate of activity of an enzyme
C) Enzymes function only in a pH range of 4.0 to 5.5.
D) The activity of an enzyme is affected by pH.

21. Which is a true statement about the relationship with their substrates in a single test tube in regards to pH and enzyme action?

A) only gastric protease would be active if the pH of the mixture was basic
B) intestinal protease would be more active than gastric protease at pH 4
C) both enzymes would exhibit some activity at pH 5
D) gastric protease would be more active than intestinal protease at pH 6

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22. Which substance is an inorganic compound that is necessary for most of the chemical reactions to take place in living cells?

A) glucose B) starch C) water D) amino acid

23. To increase chances for a successful organ transplant, the person receiving the organ should be given special medications. The purpose of these medications is to

A) increase the immune response in the person receiving the transplant
B) decrease the immune response in the person receiving the transplant
C) decrease mutations in the person receiving the transplant
D) increase mutations in the person receiving the transplant

24. All cells of an organism are engaged in many different chemical reactions. This fact is best supported by the presence in each cell of thousands of different kinds of

A) enzymes B) nuclei C) chloroplasts D) organelles

25. Select the immune reaction, *chosen from the list below*, that is best described by that statement.
Immune Reactions
(1) Passive immunity
(2) Allergy
(3) Rejection

Bronchial tubes constrict during an asthma attack.

A) 1 B) 2 C) 3

Base your answers to questions **26** and **27** on the list of molecules below. Select the immune response, *chosen from the list below*, that is most closely associated with that phrase.

Immune Response
(1) Active immunity
(2) Passive immunity
(3) Allergies
(4) Tissue rejection

26. A vaccine containing a weakened disease-causing organism is injected into the body.

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

27. Chemicals known as histamines are released as a result of antibody production.

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

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28. An individual who has had chicken pox rarely gets this disease again. This situation is an example of

A) biological control B) negative feedback
C) active immunity D) passive immunity

29. In which stage of the human menstrual cycle is the lining of the uterus shed?

A) Ovulation
B) Follicle stage
C) Menstruation
D) Corpus luteum stage

30. Researchers Cohn and Boyer transferred a gene from an African clawed frog into a bacterium. To accomplish this, these scientists had to use

A) enzymes to cut out and insert the gene
B) hereditary information located in amino acids
C) radiation to increase the gene mutation rate of the bacterial cells
D) cancer cells to promote rapid cell division

31. Base your answer to the following question on the reading passage below and on your knowledge of biology.

Polio Vaccines

Polio is a disease that results in the destruction of nerve cells. The first vaccine against polio was developed by Jonas Salk and was made from polio viruses that were killed using the chemical formalin. In 1953, Salk tested the vaccine on himself, his wife, and his three sons. The vaccine was found to be safe and seemed to work. In 1954, more than 1.8 million schoolchildren were part of a trial to test the vaccine, and in April 1955, the vaccine was declared to be safe and effective.

Albert Sabin also developed a vaccine against polio. The vaccine developed by Sabin was made from weakened polio viruses. While the Salk vaccine had to be injected, the Sabin vaccine was administered orally on a cube of sugar.

Both vaccines were found to be effective in protecting people against polio because these vaccines stimulate immune responses involving antibody production. However, the Sabin vaccine is effective over a longer period of time and is easier to administer. Together, these vaccines have nearly eliminated polio in many parts of the world.

Which statement about the Salk vaccine is correct?

A) Dead viruses are injected.
B) Antibodies are injected.
C) Antibodies are administered orally.
D) Sugar cubes are administered orally.

32. A person with allergies may develop a rash and swollen eyes when exposed to certain substances. These symptoms are a reaction to

A) histamines produced as a result of an immune reaction
B) antigens produced as a result of passive immunity
C) phagocytosis, resulting in the destruction of body cells
D) an increase in the number of platelets

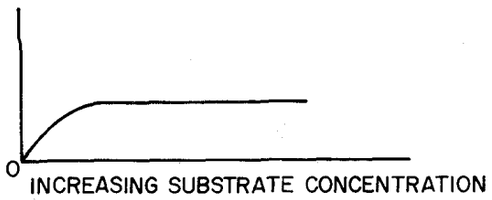
33. Which is the correct sequence of events in a normal menstrual cycle?

A) menstruation→corpus→luteum stage→follicle development→ovulation
B) ovulation→menstruation→corpus luteum stage→follicle development
C) corpus luteum stage→follicle development→menstruation→ovulation
D) follicle development→ovulation→corpus luteum stage→menstruation

34. Which characteristic allows enzymes to function in a specific way?

A) Enzymes are complex compounds composed of starch.
B) Each enzyme has a characteristic shape.
C) Enzymes are long, complex fats.
D) Each enzyme is made up of four subunits.

35. Base your answer to the following question on If the enzyme represented in the graph below functions like most enzymes, which would be the best label for the vertical axis of the graph? [Assume enzyme concentration remains constant.]



A) Rate of Enzyme Action
B) Particle Size of Enzyme
C) Increasing Temperature
D) Particle Size of Substrate

36. Which statement best describes an immune response?

A) It always produces antibiotics.
B) It usually involves the recognition and destruction of pathogens.
C) It stimulates asexual reproduction and resistance in pathogens.
D) It releases red blood cells that destroy parasites.

37. 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) passive immunity
C) an oral vaccine
D) a phagocytic activity

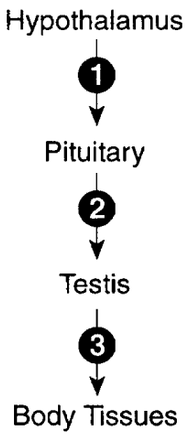
38. People with AIDS are unable to fight multiple infections because the virus that causes AIDS

A) weakens their immune systems
B) produces antibodies in their blood
C) attacks muscle tissue
D) kills pathogens

39. Allergic reactions are most closely associated with

A) the action of circulating hormones
B) a low blood sugar level
C) immune responses to usually harmless substances
D) the shape of red blood cells

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



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

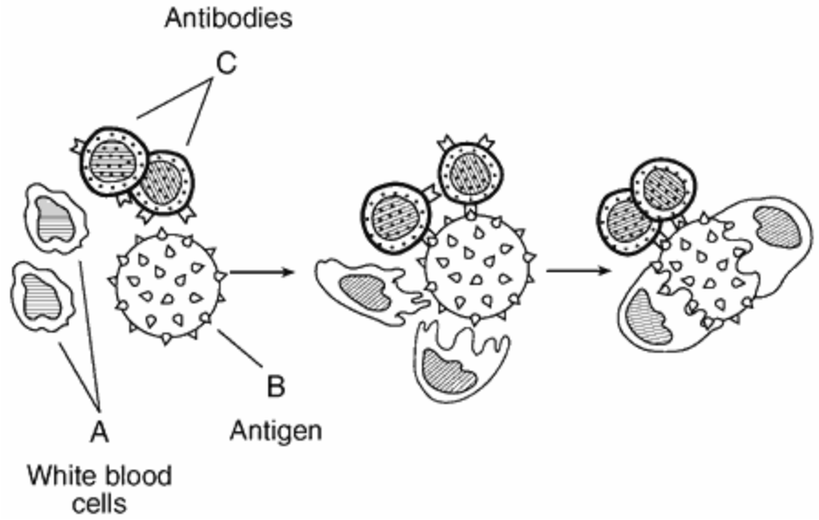
41. Many vaccinations stimulate the immune system by exposing it to

A) antibodies
B) enzymes
C) mutated genes
D) weakened microbes

42. Some pituitary hormones cause the ovaries to secrete hormones. These ovarian hormones then influence the production of the pituitary hormones. This type of control mechanism is known as

A) ovulation
B) negative feedback
C) gametogenesis
D) a menstrual cycle

43. The diagram below represents one possible immune response that can occur in the human body.



The structures that are part of the immune system are represented by

A) *A,* only B) *A* and *C,* only C) *B* and *C,* only D) *A, B,* and *C*

44. The use of a vaccine to stimulate the immune system to act against a specific pathogen is valuable in maintaining homeostasis because

A) once the body produces chemicals to combat one type of virus, it can more easily make antibiotics
B) the body can digest the weakened microbes and use them as food
C) the body will be able to fight invasions by the same type of microbe in the future
D) the more the immune system is challenged, the better it performs

45. An increase in the level of thyroxin in the blood inhibits the release of thyroid-stimulating hormone. This mechanism illustrates

A) negative feedback B) enzymatic synthesis
C) osmotic regulation D) enzyme specificity

46. People who have AIDS are more likely than others to become ill with multiple infections because the pathogen that causes AIDS

A) targets many body systems
B) mutates, releasing toxins directly into the bloodstream
C) increases the rate of enzyme activity in different types of body cells
D) damages the immune system

47. Responses of the immune system to usually harmless environmental substances are known as

A) antigen production B) chromosomal mutations
C) pathogens D) allergies

48. A 6-year-old child ate a peanut butter sandwich at snack time in school. Five minutes later, her throat became swollen and she collapsed. This allergic reaction occurred because her body

A) recognized an antigen in peanut butter and produced antibiotics against it
B) digested the white blood cells that can recognize an antigen in peanut butter
C) did not recognize an antigen in peanut butter and could not produce antibodies against it
D) recognized an antigen in peanut butter and produced an immune response

49. An individual recovers from the common cold, which is caused by rhinovirus *A.* The person then becomes infected with the avian influenza virus, which causes the bird flu. Which statement best describes what will most likely happen to this person?

A) He will have the symptoms of the bird flu because he is not immune to the avian influenza virus.
B) He will have the symptoms of the common cold because he is not immune to the avian influenza virus.
C) He will not have the symptoms of the bird flu because he is immune to rhinovirus *A.*
D) He will not have the symptoms of the common cold because the avian influenza virus causes it.

50. The hormone FSH stimulates the development of a follicle in the human female. As the follicle develops, it secretes estrogen. A high level of estrogen decreases the secretion of FSH. This mechanism is an example of

A) cell differentiation
B) in vitro fertilization
C) positive tropism
D) negative feedback