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

(1) releasing hormones that break down these chemicals
(2) synthesizing antibodies that mark these organisms to be destroyed
(3) secreting antibiotics that attach to these organisms
(4) altering a DNA sequence in these organisms
Answer = 2
23 Vaccinations help prepare the body to fight invasions of a specific pathogen by
(1) inhibiting antigen production
(2) stimulating antibody production
(3) inhibiting white blood cell production
(4) stimulating red blood cell production
January 2006

Answer: 2
21 Which transplant method would prevent the rejection of tissue after an organ transplant?

(1) using organs cloned from the cells of the patient
(2) using organs produced by genetic engineering to get rid of all proteins in the donated organs
(3) using organs only from pigs or monkeys
(4) using an organ donated by a close relative because the proteins will always be identical to those of the recipient
January 2006

Answer: 1
22 Which statement best describes what will most likely happen when an individual receives a vaccination containing a weakened pathogen?

(1) The ability to fight disease will increase due to antibodies received from the pathogen.

(2) The ability to fight disease caused by the pathogen will increase due to antibody production.

(3) The ability to produce antibodies will decrease after the vaccination.

(4) The ability to resist most types of diseases will increase.
June 2004 Regents

Answer: 2
59 AIDS is an infectious disease that has reached epidemic proportions. Describe the nature of this disease and identify two ways to prevent or control the spread of infectious diseases, such as AIDS. In your response be sure to include:

- the type of pathogen that causes AIDS [1]
- the system of the body that is attacked by that pathogen [1]
- the effect on the body when this system is weakened by AIDS [1]
- two ways to prevent or control the spread of infectious diseases, such as AIDS [2]
June 2004 Regents

- Virus
- Immune System
- The body will be more prone / susceptible to infectious disease
- Abstinence, condoms, no shared needles
4 The virus that causes bird flu can attach to the cells of the lower part of the respiratory system in humans, but not to the cells of the upper part of the respiratory system. The most likely reason for this is that these two groups of cells have different

(1) DNA codes in their nuclei
(2) enzymes in their mitochondria
(3) amounts of water in their cytoplasm
(4) receptor molecules on their membranes
January 2010

Answer: 4
A normally healthy 35-year-old woman was found to have a severe intestinal infection usually seen in much older and sicker patients in hospitals. Because of so many cases like hers, some doctors became alarmed that the organism responsible could spread rapidly and cause unusually severe illnesses and some deaths. Scientists suspect that the cause is a mutated form of an organism that has a resistance to some of the most common treatments.
Since it is difficult to cure an infection caused by this organism, it might be easier to prevent these infections by using a vaccine. Identify the specific material a vaccine would have to contain to prevent future infections.  [1]
Weakened or dead form of the pathogen.
Explain how this vaccine would prevent future infections. [1]
The body would have created memory cells to recognize the pathogen. When the active virus attacks, the body will be ready with antibodies and an immediate immune response.
The mutated form of this type of organism could result from a change in a molecule within one member of the original population. Identify the molecule. [1]
12 Viruses frequently infect bacteria and insert new genes into the genetic material of the bacteria. When these infected bacteria reproduce asexually, which genes would most likely be passed on?

(1) only the new genes
(2) only the original genes
(3) both the original and the new genes
(4) neither the original nor the new genes
Answer: 3
Until the middle of the 20th century, transplanting complex organs, such as kidneys, was rarely successful. The first transplant recipients did not survive. It was not until 1954 that the first successful kidney transplant was performed. Success with transplants increased as research scientists developed techniques such as tissue typing and the use of immunosuppressant drugs. These are drugs that suppress the immune system to prevent the rejection of a transplanted organ. In 2002, there were nearly 15,000 kidney transplants performed in the United States with a greater than 95% success rate.
Describe the relationship of the immune system to organ transplants and the use of immunosuppressant drugs to prevent the rejection of a transplanted organ. In your answer be sure to:

- state *one* way the immune system is involved in the rejection of transplanted organs [1]
- explain why the best source for a donated kidney would be the identical twin of the recipient [1]
- explain why immunosuppressant drugs might be needed to prevent rejection of a kidney received from a donor other than an identical twin [1]
- state *one* reason a person may get sick more easily when taking an immunosuppressant drug [1]
The immune system will recognize the organ as foreign and try to destroy it.

An identical twin would have the same DNA and same cells.

Suppressing the immune system will allow the organ to survive in the body and not be destroyed.

The immune system will be weaker and not react readily to an invading pathogen.
56 Many people become infected with the chicken pox virus during childhood. After recovering from chicken pox, these people are usually immune to the disease for the rest of their lives. However, they may still be infected by viruses that cause other diseases, such as measles.
Discuss the immune response to the chicken pox virus. In your answer, be sure to include:

- the role of antigens in the immune response [1]
- the role of white blood cells in the body’s response to the virus [1]
- an explanation of why recovery from an infection with the chicken pox virus will not protect a person from getting a different disease, such as measles [1]
- an explanation of why a chicken pox vaccination usually does not cause a person to become ill with chicken pox [1]
Antigens are foreign proteins that cause an immune response.

There are several types of white blood cells. B cells create plasma cells which make antibodies. T cells destroy anything marked with an antibody. Plasma cells remember the pathogen.
June 2005

The immune response is specific and the body will only recognize the chicken pox virus, which has different antigens than other viruses.

The chicken pox vaccine usually does NOT make people sick, because the vaccine is made of a dead or weakened form of the virus.
To replace burned skin, doctors can successfully transplant replacement skin taken from another part of the body of the burn victim. Which statement best explains why the transplanted skin is not rejected?

1. The transplanted skin is damaged, making the immune system nonfunctional.
2. The antigens of the replacement skin are the same as those of the damaged skin.
3. Burn victims lose so much blood that white blood cells cannot cause an immune response.
4. There is no blood supply to the skin, so mixing of antigens does not occur.
August 2009

Answer: 2
A vaccine used against an infectious disease may contain

1. specialized blood cells
2. toxic enzymes
3. a variety of antibiotics
4. weakened pathogens
August 2009

Answer: 4