

MULTIPLE CHOICE

1. What is a significant cause of morbidity and mortality worldwide?
 - a. Starvation
 - b. Traumatic injury
 - c. Cardiovascular disease
 - d. Infectious disease

ANS: D

Despite the wide-scale implementation of progressive public health and immunization policies, infectious disease remains a significant cause of morbidity and mortality. The other options are not as significant.

PTS: 1 DIF: Cognitive Level: Remembering

2. What is the first stage in the infectious process?
 - a. Invasion
 - b. Colonization
 - c. Spread
 - d. Multiplication

ANS: B

From the perspective of the microorganisms that cause disease, the infectious process undergoes four separate stages of progression: (1) colonization, (2) invasion, (3) multiplication, and (4) spread.

PTS: 1 DIF: Cognitive Level: Remembering

3. Which type of microorganism reproduces on the skin?
 - a. Viruses
 - b. Bacteria and fungi
 - c. Protozoa and *Rickettsias*
 - d. *Mycoplasma*

ANS: B

Only bacteria and fungi have the capacity to reproduce on the skin.

PTS: 1 DIF: Cognitive Level: Remembering

4. Phagocytosis involves neutrophils actively attacking, engulfing, and destroying which microorganisms?
 - a. Bacteria
 - b. Fungi
 - c. Viruses
 - d. Yeasts

ANS: A

Invasion is the direct confrontation with an individual's primary defense mechanisms against only bacteria, which include the complement system, antibodies, and phagocytes, such as neutrophils and macrophages. Fungi, viruses, and yeasts are not phagocytosed.

PTS: 1 DIF: Cognitive Level: Remembering

5. Once they have penetrated the first line of defense, which microorganisms do natural killer (NK) cells actively attack?
 - a. Bacteria
 - b. Fungi
 - c. Viruses
 - d. *Mycoplasma*

ANS: C

NK cells are the principal defenders against only tumor cells or virally infected cells.

PTS: 1 DIF: Cognitive Level: Remembering

6. A student asks the healthcare professional to describe exotoxins. Which statement *by the professional is best*?
 - a. Exotoxins are contained in cell walls of gram-negative bacteria.
 - b. Exotoxins are released during the lysis of bacteria.
 - c. Exotoxins are able to initiate the complement and coagulation cascades.
 - d. Exotoxins are released during bacterial growth.

ANS: D

Exotoxins are proteins released during bacterial growth. Exotoxins are not contained in cell walls of gram-negative bacteria, released during lysis of bacterial, or able to initiate the complement and coagulation cascades.

PTS: 1 DIF: Cognitive Level: Understanding

7. A healthcare professional student is learning about fungal infections. What information should the student use to help another student understand?
- Fungal infections occur only on skin, hair, and nails.
 - Phagocytes and T lymphocytes control fungal infections.
 - Fungal infections release endotoxins.
 - Vaccines prevent fungal infections.

ANS: B

The host defense against fungal infection includes the fungistatic properties of neutrophils and macrophages. T lymphocytes are crucial in limiting the extent of infection and producing cytokines to further activate macrophages. Fungi infect other tissue types such as vaginal or gastrointestinal. Fungi do not release endotoxins; they reside in the cell walls of gram-negative bacteria. Fungal infections are not prevented by current vaccines.

PTS: 1 DIF: Cognitive Level: Understanding

8. Cytokines are thought to cause fevers by stimulating the synthesis of which chemical mediator?
- Leukotriene
 - Histamine
 - Prostaglandin
 - Bradykinin

ANS: C

Cytokines seem to raise the thermoregulatory set point through stimulation of prostaglandin synthesis and turnover in thermoregulatory (brain) and nonthermoregulatory (peripheral) tissues. Leukotrienes, histamine, and bradykinin are not directly related to fever production.

PTS: 1 DIF: Cognitive Level: Remembering

9. Considering the hypothalamus, what is a fever produced by?
- Endogenous pyrogens acting directly on the hypothalamus
 - Exogenous pyrogens acting directly on the hypothalamus
 - Immune complexes acting indirectly on the hypothalamus
 - Cytokines acting indirectly on the hypothalamus

ANS: A

Exogenous pyrogens indirectly affect the hypothalamus through the release of endogenous pyrogens by cells of the host, however; a number of cytokines have been identified as endogenous pyrogens and these act directly on the hypothalamus. Neither immune complexes nor cytokines are involved in the process.

PTS: 1 DIF: Cognitive Level: Remembering

10. A healthcare professional is conducting community education on vaccinations. Which statement about vaccines does the professional include in the presentation?
- Most bacterial vaccines contain attenuated organisms.
 - Most viral vaccines are made by using dead organisms.
 - Vaccines require booster injections to maintain life-long protection.
 - Vaccines provide effective protection against most infections.

ANS: C

In general, vaccine-induced protection does not persist as long as infection-induced immunity, thus booster injections may be necessary to maintain protection throughout the life. Some common bacterial vaccines are killed microorganisms, extracts of bacterial antigens, or toxoids.

PTS: 1 DIF: Cognitive Level: Understanding

11. What are vaccines against viruses created from?
- Killed organisms or extracts of antigens
 - Live organisms weakened to produce antigens
 - Purified toxins that have been chemically detoxified
 - Recombinant pathogenic protein

ANS: B

Most vaccines against viral infections (e.g., measles, mumps, rubella, varicella [chickenpox], rotavirus) contain live viruses that are weakened (attenuated) to continue expressing the appropriate antigens but are unable to establish more than a limited and easily controlled infection. Vaccines against viruses do not contain extracts of antigens, purified toxins, or recombinant pathogenic proteins.

PTS: 1 DIF: Cognitive Level: Remembering

12. What does the student learn about HIV?
- HIV only infects T-helper (Th) cells.
 - HIV is a retrovirus.
 - HIV carries genetic information in its DNA.
 - HIV has five identified strains.

ANS: B

HIV is a member of the retrovirus family, which carries genetic information in the form of two copies of RNA. The major immunologic finding in AIDS is the striking decrease in the number of CD4+ Th cells. The major surface receptor on the HIV virus binds to the CD4 molecule found mostly on the surface of T-helper cells. There appear to be two strains of HIV: HIV-1 and HIV-2.

PTS: 1 DIF: Cognitive Level: Remembering

13. What is the role of reverse transcriptase in HIV infection?
- Reverse transcriptase converts single-stranded DNA into double-stranded DNA.
 - It is needed to produce integrase.
 - It transports the RNA into the cell nucleus.
 - It converts RNA into double-stranded DNA.

ANS: D

HIV is a retrovirus and carries an enzyme, *reverse transcriptase*, which creates a double-stranded DNA version of the virus. HIV virus does not contain DNA. Reverse transcriptase does not transport the RNA into the cell nucleus.

PTS: 1 DIF: Cognitive Level: Remembering

14. After sexual transmission of HIV, how soon can lab results detect the infection?
- 1 to 2 days
 - 4 to 10 days
 - 4 to 8 weeks
 - 2 to 4 months

ANS: B

HIV RNA may be detected in the plasma by about 4 to 10 days after an acute infection and HIV.

PTS: 1 DIF: Cognitive Level: Remembering

15. Which cells are primary targets for HIV?
- CD4⁺ Th cells only
 - CD4⁺ Th cells, macrophages, and dendritic cells
 - CD8-positive cytotoxic T (Tc) cells and plasma cells
 - CD8-positive Tc cells only

ANS: B

The primary cellular targets for HIV include CD4⁺ Th cells, macrophages, and dendritic cells. The other cell types are not the primary target cells of HIV.

PTS: 1 DIF: Cognitive Level: Remembering

16. What area in the body may act as a reservoir in which HIV can be relatively protected from antiviral drugs?
- Central nervous system
 - Bone marrow
 - Thymus gland
 - Lungs

ANS: A

HIV may persist in regions where the antiviral drugs are not as effective, such as the central nervous system (CNS). The bone marrow, thymus gland, and lungs are not as protected from antiviral drugs.

PTS: 1 DIF: Cognitive Level: Remembering

17. What is the final stage of the infectious process?
- Colonization
 - Invasion
 - Multiplication
 - Spread

ANS: D

From the perspective of the microorganisms that cause disease, the infectious process undergoes four separate stages of progression: (1) colonization, (2) invasion, (3) multiplication, and (4) spread.

PTS: 1 DIF: Cognitive Level: Remembering

18. How is toxigenicity defined?
- The ability of the pathogen to invade and multiply in the host
 - The pathogen's ability to produce disease by the production of a soluble toxin
 - The ability of an agent to produce disease
 - The potency of a pathogen measured in terms of the number of microorganisms required to kill the host

ANS: B

Toxigenicity is the ability of a pathogen to produce soluble toxins or endotoxins, which are factors that greatly influence the pathogen's degree of virulence. The other options do not accurately define toxigenicity.

PTS: 1 DIF: Cognitive Level: Remembering

19. What is the ability of the pathogen to invade and multiply in the host referred to as?
- Infectivity
 - Toxigenicity
 - Pathogenicity
 - Virulence

ANS: A

Infectivity is the ability of the pathogen to invade and multiply in the host. The other options do not accurately denote the pathogen's ability to invade and multiply in the host.

PTS: 1 DIF: Cognitive Level: Remembering