REVIEW QUESTIONS

1. Some viruses are characterized by helical symmetry of the viral nucleocapsid. Which of the following statements about viruses with helical symmetry is most accurate?
   (A) All enveloped viruses with helical symmetry are classified into the same virus family.
   (B) Helical nucleocapsids are found primarily in DNA-containing viruses.
   (C) All human viruses with helical nucleocapsids possess an envelope.
   (D) Excess empty helical particles containing no nucleic acid are commonly produced in infected cells.
2. Virus-infected cells often develop morphologic changes referred to as cytopathic effects. Which of the following statements about virus-induced cytopathic changes is most accurate?
   (A) They are pathognomonic for an infecting virus.
   (B) They are rarely associated with cell death.
   (C) They may include giant cell formation.
   (D) They can only be seen with an electron microscope.
3. Viruses usually initiate infection by first interacting with receptors on the surface of cells. Which of the following statements is most accurate about cellular receptors for viruses?
   (A) Cellular receptors for viruses have no known cellular function.
   (B) All viruses within a given family use the same cellular receptor.
   (C) All cells in a susceptible host express the viral receptor.
   (D) Successful infection of a cell by a virus may involve interaction with more than one type of receptor.
4. Which of the following can be used to quantitate the infectious titer of viruses?
   (A) Plaque assay
   (B) Electron microscopy
   (C) Hemagglutination
   (D) Polymerase chain reaction
   (E) Enzyme immunoassay
5. Which one of the following states a principle regarding viral nucleic acid?
   (A) Viruses contain both RNA and DNA.
   (B) Some viruses contain a segmented genome.
   (C) Purified viral nucleic acid from any virus is usually infectious.
   (D) Viral genome sizes are similar among known human viruses.
6. Two mutants of poliovirus have been isolated, one (MutX) with a mutation in gene X and the second (MutY) with a mutation in gene Y. If cells are infected with each mutant alone, no virus is produced. If a cell is coinfected with both MutX and MutY, which one of the following is most likely to occur?
   (A) Reassortment of genome segments may occur and give rise to a viable wild-type virus.
   (B) The genomes may be reverse transcribed to DNA and both MutX and MutY viruses produced.
   (C) Complementation between the mutant gene products may occur and both MutX and MutY viruses produced.
   (D) The cells will transform at high frequency because they will not be killed by the poliovirus mutants.
7. Which one of the following viruses possesses an RNA genome that is infectious when purified?
   (A) Influenza virus
   (B) Poliovirus
   (C) Papillomavirus
   (D) Measles virus
   (E) Rotavirus
8. Viruses belonging to which of the following groups are likely to establish latent infections?
   (A) Poxviruses
   (B) Filoviruses
   (C) Herpesviruses
   (D) Influenza viruses
   (E) Caliciviruses
9. Some viruses encode for a viral RNA-dependent RNA polymerase. Which of the following states a principle about viral RNA polymerases?
   (A) All RNA viruses carry RNA polymerase molecules inside virus particles because they are needed to initiate the next infectious cycle.
   (B) Antibodies against the viral RNA polymerase neutralize virus infectivity.
   (C) Negative-strand RNA viruses supply their own RNA-dependent RNA polymerase because eukaryotic cells lack such enzymes.
   (D) The viral RNA polymerase protein also serves as a major core structural protein in the virus particle.
10. Which of the following statements regarding virus morphology is true?
    (A) All RNA viruses are spherical in shape.
    (B) Some viruses contain flagella.
    (C) Some viruses with DNA genomes contain a primitive nucleus.
    (D) Viral surface proteins protect the viral genome from nucleases.
    (E) Helical nucleocapsids are found with single-stranded DNA viruses.
11. Many viruses can be grown in the laboratory. Which of the following statements about virus propagation is not true?
    (A) Some viruses can be propagated in cell-free media.
    (B) Some mammalian viruses can be cultivated in hen's eggs.
    (C) Some viruses with broad host ranges can multiply in many types of cells.
    (D) Some human viruses can be grown in mice.
    (E) Most virus preparations have particle-to-infectious unit ratios greater than 1.
12. Laboratory infections can be acquired when working with viruses unless good laboratory safety practices are followed. Which of the following is not a good biosafety practice?
    (A) Use of biosafety hoods
    (B) Use of laboratory coats and gloves
    (C) Avoidance of pipetting by mouth
    (D) Flushing experimental waste down laboratory sink
    (E) Not eating or drinking in the laboratory
13. Small viruses are in the same size range as which of the following?
    (A) *Staphylococcus* species
    (B) Serum globulin
    (C) Red blood cells
    (D) Eukaryotic ribosomes
    (E) Mitochondria

14. Which of the following is not an important factor contributing to the phenomenon of emerging viral diseases?
    (A) International air travel
    (B) Antibiotic resistance
    (C) Deforestation
    (D) War
    (E) Organ and tissue transplantation
15. Arboviruses are classified into several different virus families but are grouped together based on which of the following common characteristics?
    (A) Replicate only in humans
    (B) Contain both RNA and DNA
    (C) Are transmitted by vectors
    (D) Cause hemorrhagic fevers
    (E) Cause encephalitis

Answers

1. C	5. B	9. C	13. D
2. C	6. C	10. D	14. B
3. D	7. B	11. A	15. C
4. A	8. C	12. D	

REVIEW QUESTIONS

1. Interferons are an important part of the host defense against viral infections. What is interferon's principal mode of action?
   (A) It is present in the serum of healthy individuals, providing a viral surveillance role.
   (B) It coats viral particles and blocks their attachment to cells.
   (C) It induces synthesis of one or more cellular proteins that inhibit translation or transcription.
   (D) It protects the virus-infected cell that produced it from cell death.
2. A 9-month-old girl is taken to the emergency room because of fever and persistent cough. Rales are heard in her left chest on physical examination. An infiltrate in her left lung is seen on the chest radiograph. Pneumonia is diagnosed. Which of the following is the most likely cause?
   (A) Rotavirus
   (B) Rhinovirus
   (C) Adenovirus
   (D) Respiratory syncytial virus
   (E) Coxsackievirus
3. Which one of the following is a fundamental principle of viral disease causation?
   (A) One virus type induces a single disease syndrome.
   (B) Many viral infections are subclinical and do not produce clinical disease.
   (C) The type of disease produced by a virus can be predicted by the morphology of that virus.
   (D) A particular disease syndrome has a single viral cause.
4. The skin is an impenetrable barrier to virus entry, but a few viruses are able to breach this barrier and initiate infection of the host. Which of the following is an example of a virus that enters through skin abrasions?
   (A) Adenovirus
   (B) Rotavirus
   (C) Rhinovirus
   (D) Papillomavirus
   (E) Influenza virus
5. A 40-year-old man has HIV/AIDS characterized by a low CD4 count and a high viral load. Highly active antiretroviral therapy (HAART) will be initiated. One of the drugs under consideration is a nucleoside analog that inhibits viral reverse transcriptase and is active against both HIV and hepatitis B virus. That drug is
   (A) Acyclovir
   (B) Amantadine
   (C) Ribavirin
   (D) Saquinavir
   (E) Lamivudine
   (F) Fuzeon
6. Regarding the HIV/AIDS patient in Question 5, a peptidomimetic agent that blocks virus-mediated cleavage of viral structural protein precursors is chosen as a second drug. That drug is
   (A) Acyclovir
   (B) Amantadine
   (C) Ribavirin
   (D) Saquinavir
   (E) Lamivudine
   (F) Fuzeon
7. A 63-year-old woman is hospitalized for treatment of leukemia. One day after admission she develops chills, fever, cough, headache, and myalgia. She states that her husband had a similar illness a few days earlier. There is major concern about a respiratory virus outbreak in the staff of the chemotherapy ward and in the patients on that ward. A synthetic amine that inhibits influenza A virus by blocking viral uncoating is chosen for prophylactic treatment of the staff and patients. That drug is
   (A) Acyclovir
   (B) Amantadine
   (C) Ribavirin
   (D) Saquinavir
   (E) Lamivudine
   (F) Fuzeon

8. Which one of the following statements describes an advantage of killed-virus vaccines over attenuated live-virus vaccines?
   (A) Killed-virus vaccines induce a broader range of immune responses than do attenuated live-virus vaccines.
   (B) Killed-virus vaccines more closely mimic natural infections than do attenuated live-virus vaccines.
   (C) Killed-virus vaccines pose no risk that vaccine virus might be transmitted to susceptible contacts.
   (D) Killed-virus vaccines are efficacious against respiratory virus infections because they induce good mucosal immunity.
9. What type of hepatitis B vaccine is currently in use in the United States?
   (A) Synthetic peptide vaccine
   (B) Killed-virus vaccine
   (C) Attenuated live-virus vaccine
   (D) Subunit vaccine produced using recombinant DNA
10. Which one of the following phrases accurately describes viral neutralizing antibodies?
   (A) Directed against viral protein determinants on the outside of the virus particle
   (B) Appear in the host sooner after viral infection than interferon
   (C) Directed against viral nucleic acid sequences
   (D) Induced only by disease-causing viruses
   (E) Of little importance to immunity to viral infection
11. Many viruses use the respiratory tract as the route of entry to initiate infections. Which of the following virus groups does not?
   (A) Adenovirus
   (B) Coronavirus
   (C) Hepadnavirus
   (D) Paramyxovirus
   (E) Poxvirus
12. Which of the following licensed virus vaccines is a subunit vaccine prepared using recombinant DNA technology?
   (A) Measles–mumps–rubella
   (B) Varicella
   (C) Hepatitis A
   (D) Papilloma
   (E) Rotavirus
   (F) Rabies
13. Which of the following viruses is the most common cause of neonatal infections in the United States?
   (A) Rubella
   (B) Parvovirus B19
   (C) Hepatitis B
   (D) Cytomegalovirus
   (E) Varicella
   (F) Human immunodeficiency virus
14. Which one of the following statements concerning interferons is *least* accurate?
   (A) Interferons are proteins that influence host defenses in many ways, one of which is the induction of an antiviral state.
   (B) Interferons are synthesized only by virus-infected cells.
   (C) Interferons inhibit a broad range of viruses, not just the virus that induced the interferon.
   (D) Interferons induce the synthesis of a ribonuclease that degrades viral mRNA.
15. Each of the following statements concerning viral vaccines is correct *except*
   (A) In live attenuated vaccines, the virus has lost its ability to cause disease but has retained its ability to induce neutralizing antibody.
   (B) In live attenuated vaccines, the possibility of reversion to virulence is of concern.
   (C) With inactivated vaccines, IgA mucosal immunity is usually induced.
   (D) With inactivated vaccines, protective immunity is mainly caused by the production of IgG.

Answers

1. C	5. E	9. D	13. D
2. D	6. D	10. A	14. B
3. B	7. B	11. C	15. C
4. D	8. C	12. D	

(Adenoviruses)

REVIEW QUESTIONS

In what follows, singular may be construed as plural (or vice versa) as the sense dictates.

1. What adenovirus protein or proteins regulate early transcription of the viral genes and modulate the cell cycle?
   (A) Fiber
   (B) Hexon
   (C) Penton
   (D) Terminal protein
   (E) E1 region protein
   (F) Cysteine proteinase
   (G) E3 region protein
2. What adenovirus protein serves as primer for initiation of viral DNA synthesis?
   (A) Fiber
   (B) Hexon
   (C) Penton
   (D) Terminal protein
   (E) E1 region protein
   (F) Cysteine proteinase
   (G) E3 region protein
3. What adenovirus protein comprises the majority of capsomeres making up the virus capsid?
   (A) Fiber
   (B) Hexon
   (C) Penton
   (D) Terminal protein
   (E) E1 region protein
   (F) Cysteine proteinase
   (G) E3 region protein
4. A 3-month-old infant had watery diarrhea and fever for 10 days. Rotavirus or adenovirus types 40 and 41 are the suspected agents. What type of specimen would be most appropriate for detection of adenovirus type 40 and 41 infection in this patient?
   (A) Blood
   (B) Urine

(C) Conjunctival swab
(D) Stool
(E) Throat swab
(F) Cerebrospinal fluid

5. Which of the following human diseases has not been associated with adenoviruses?
   (A) Cancer
   (B) Common colds
   (C) Acute respiratory diseases
   (D) Keratoconjunctivitis
   (E) Gastroenteritis
   (F) Hemorrhagic cystitis
6. A 2½-year-old child attending nursery school acquires a mild respiratory infection. Other children in the nursery school have similar illnesses. Which adenovirus types are the most likely causes of the illnesses?
   (A) Types 40 and 41
   (B) Types 8, 19, and 37
   (C) Types 1, 2, 5, and 6
   (D) Types 3, 4, and 7
   (E) Types 21, 22, 34, and 35
7. Which adenovirus types are frequent causes of acute respiratory disease among military recruits?
   (A) Types 40 and 41
   (B) Types 8, 19, and 37
   (C) Types 1, 2, 5, and 6
   (D) Types 3, 4, and 7
   (E) Types 21, 22, 34, and 35
8. Which of the following events led to reappearance of acute respiratory disease outbreaks among United States military recruits in the late 1990s?
   (A) Emergence of a new virulent strain of adenovirus
   (B) Cessation of adenovirus vaccination program for recruits
   (C) Change in military housing and training conditions for recruits
   (D) Cessation of adenovirus antiviral drug therapy program for recruits
9. Your summer research project is to study the viruses that cause gastroenteritis. You recover a virus from a stool sample and notice that the growth medium on the infected cultures is highly acidic. You find that the viral genome is double-stranded DNA. Of the following, which one is the most appropriate conclusion you could draw?
   (A) There is a high likelihood that the agent is a rotavirus.
   (B) You need to determine the viral serotype to establish whether the virus was important in causing the disease.
   (C) The patient should have been treated with the antiviral drug amantadine to shorten the duration of symptoms.
   (D) The virus particle would contain a reverse transcriptase enzyme.
10. Which of the following groups of individuals is at the lowest risk of adenovirus disease?
    (A) Healthy adults
    (B) Young children
    (C) Bone marrow transplant recipients
    (D) Military recruits
    (E) AIDS patients
11. Adenoviruses can cause eye infections that are highly contagious. Which of the following is least likely to be a means of transmission during an outbreak of epidemic keratoconjunctivitis?
    (A) Swimming pools
    (B) Hand towels
    (C) Mosquito bites
    (D) Hand-to-eye
    (E) Contaminated ophthalmic equipment
12. There are 51 known types of human adenoviruses. Which of the following statements is most accurate?
    (A) Types cannot be distinguished serologically.
    (B) All cause respiratory infections in children.
    (C) Most types replicate well in T lymphocytes.
    (D) Two types can cause gastroenteritis.
13. Each of the following statements concerning adenoviruses is correct *except*
    (A) Adenoviruses are composed of a double-stranded DNA genome and a capsid without an envelope.
    (B) Adenoviruses cause both sore throat and pneumonia.
    (C) Adenoviruses have only one serologic type.
    (D) Adenoviruses are implicated as a cause of tumors in animals but not humans.
14. Which of the following conditions is *least* likely to be caused by adenoviruses?
    (A) Conjunctivitis
    (B) Pneumonia
    (C) Pharyngitis
    (D) Glomerulonephritis

Answers

1. E	5. A	9. B	13. C
2. D	6. C	10. A	14. D
3. B	7. D	11. C	
4. D	8. B	12. D	

Parvoviruses

REVIEW QUESTIONS

1. Which one of the following best describes a physicochemical property of parvoviruses?
   (A) Enveloped virus particle
   (B) Single-stranded DNA genome
   (C) Infectivity is inactivated by ether treatment
   (D) Virion exhibits helical symmetry
   (E) Virion is about the same size as herpesviruses

2. An 8-year-old child recently had erythema infectiosum. Her 33-year-old mother subsequently developed arthralgia followed by painful arthritis with swelling in the small joints of both hands. In addition to the apparent tropism for joints, human parvovirus B19 is highly tropic for which cell type?
   (A) CD4 T lymphocytes
   (B) Renal tubule cells
   (C) Erythroid cells
   (D) Glial cells
   (E) Peyer patches
3. The 8-year-old child in Question 2 had an illness with more than one phase. Which symptoms coincide with the second phase of the illness?
   (A) Sore throat
   (B) Skin rash
   (C) Headache
   (D) Diarrhea
   (E) Cough
4. A 42-year-old man with HIV/AIDS presented with aplastic anemia. Using the polymerase chain reaction, parvovirus B19 was detected in his serum. The patient presumably acquired his parvovirus B19 infection from another person. The most likely route of transmission is
   (A) By contact with respiratory secretions or droplets
   (B) By contact with a skin rash
   (C) Through sexual activity
   (D) Through a recent blood transfusion
5. Which one of the following is a disease in which the role of parvovirus B19 has not been established?
   (A) Erythema infectiosum (fifth disease)
   (B) Transient aplastic crisis
   (C) Hydrops fetalis
   (D) Fulminant hepatitis
6. Which one of the following best describes the replication of human parvovirus B19?
   (A) Stimulates resting cells to proliferate
   (B) Uses blood group antigen P as cellular receptor
   (C) Readily establishes persistent infections
   (D) Entire replication cycle occurs in cytoplasm
   (E) Production of infectious progeny requires the presence of a helper virus
7. Which one of the following statements is most accurate concerning human infections by parvovirus B19?
   (A) Parvovirus B19 is transmitted readily by sexual intercourse.
   (B) Patients with disseminated disease caused by parvovirus B19 should be treated with acyclovir.
   (C) Parvovirus B19 does not cause any human disease.
   (D) There is no vaccine for human parvovirus.
8. Human bocavirus is a newly discovered parvovirus. It has been detected most frequently in which type of sample?
   (A) Urine
   (B) Cord blood
   (C) Respiratory secretions
   (D) Fetal liver
   (E) Bone marrow
9. Which of the following is available as a treatment or preventative for parvovirus B19 infections?
   (A) Commercial immunoglobulin
   (B) Vaccine containing recombinant VP2 viral antigen
   (C) Bone marrow transplantation
   (D) Antiviral drug that blocks virus–receptor interaction
10. Human erythroviruses and bocaviruses share the following properties except for which one?
   (A) Small, nonenveloped virus particles
   (B) Difficult to culture
   (C) Cause anemia
   (D) Global distribution
   (E) No vaccine exists

Answers

1. B	4. A	7. D	10. C
2. C	5. D	8. C	
3. B	6. B	9. A	

REVIEW QUESTIONS

1. A previously healthy 3-year-old boy develops a classic viral childhood illness. Which of the following primary viral infections of childhood is usually symptomatic?
   (A) Cytomegalovirus
   (B) Epstein-Barr virus
   (C) Hepatitis B virus
   (D) Varicella-zoster virus
   (E) Parvovirus B19
2. Which one of the following is a recommended therapy for herpes simplex virus genital infection?
   (A) Acyclovir
   (B) Attenuated live virus vaccine
   (C) Herpes immune globulin
   (D) Interferon-α
   (E) Ribavirin
3. Most herpesvirus infections are endemic worldwide. Which one of the following viruses shows marked geographic differences in seroprevalence?
   (A) Cytomegalovirus
   (B) Epstein-Barr virus
   (C) Herpes simplex virus type 2
   (D) Kaposi sarcoma herpesvirus
   (E) Varicella-zoster virus
4. A 19-year-old female college student has a fever, sore throat, and lymphadenopathy accompanied by lymphocytosis with atypical cells and an increase in sheep cell agglutinins. The diagnosis is most likely
   (A) Infectious hepatitis
   (B) Infectious mononucleosis
   (C) Chickenpox
   (D) Herpes simplex infection
   (E) Viral meningitis
5. A Tzanck smear of a scraping obtained from a vesicle on the skin demonstrates multinucleated giant cells. Multinucleated giant cells are associated with which of the following viruses?
   (A) Varicella-zoster
   (B) Variola major
   (C) Coxsackievirus
   (D) Molluscum contagiosum
6. Which of the following statements about betaherpesviruses is not true?
   (A) They establish latent infections and persist indefinitely in infected hosts.
   (B) They are reactivated in immunocompromised patients.
   (C) Most infections are subclinical.
   (D) They can infect lymphoid cells.
   (E) They have short, cytolytic growth cycles in cultured cells.
7. A 28-year-old woman has recurrent genital herpes. Which of the following statements about genital herpes infections is true?
   (A) Reactivation of latent virus during pregnancy poses no threat to the newborn.
   (B) Virus cannot be transmitted in the absence of apparent lesions.
   (C) Recurrent episodes caused by reactivation of latent virus tend to be more severe than the primary infection.
   (D) They can be caused by either herpes simplex virus type 1 or type 2.
   (E) Latent herpes simplex virus can be found in dendritic cells.
8. Which of the following viruses causes a mononucleosis-like syndrome and is excreted in the urine?
   (A) Cytomegalovirus
   (B) Epstein-Barr virus
   (C) Human herpesvirus 6
   (D) Varicella-zoster virus
   (E) Herpes simplex virus type 2

9. A 53-year-old woman develops fever and focal neurologic signs. Magnetic resonance imaging shows a left temporal lobe lesion. Which of the following tests would be most appropriate to confirm a diagnosis of herpes simplex encephalitis in this patient?
   (A) Brain biopsy
   (B) Tzanck smear
   (C) Polymerase chain reaction assay for viral DNA in cerebrospinal fluid
   (D) Serologic test for viral IgM antibody
10. Which of the following tumors is caused by a virus other than Epstein-Barr virus?
   (A) Posttransplant lymphomas
   (B) Hodgkin disease
   (C) Kaposi sarcoma
   (D) AIDS-related central nervous system non-Hodgkin lymphomas
   (E) Burkitt lymphoma
11. An outbreak of a rash called "mat herpes" occurred among high school students who had competed in a wrestling tournament. Which of the following statements is most accurate?
   (A) The rash is not contagious among wrestlers.
   (B) The causative agent is herpes simplex virus type 1.
   (C) The causative agent is varicella-zoster virus.
   (D) Lesions typically last 1 month or longer.
   (E) Students should be vaccinated before participating in wrestling tournaments.
12. The shingles vaccine is recommended for which of the following groups?
   (A) Healthy adolescents
   (B) Individuals older than age 60 years
   (C) Pregnant women
   (D) Those who never had chickenpox
13. The most common congenital infection is caused by
   (A) Varicella-zoster virus
   (B) Herpes simplex virus type 2
   (C) Human herpesvirus 8 (Kaposi sarcoma herpesvirus)
   (D) Cytomegalovirus
   (E) Parvovirus
14. Which of the following groups are at increased risk for herpes zoster?
   (A) Persons at advanced age
   (B) Patients with atopic dermatitis
   (C) Pregnant women
   (D) Persons who have been vaccinated with varicella vaccine
   (E) Infants with congenital infections
15. Which one of the following is the *best* explanation for the selective action of acyclovir (acycloguanosine) in herpes simplex virus (HSV)-infected cells?
   (A) Acyclovir binds specifically to viral receptors only on the surface of the HSV-infected cell.
   (B) Acyclovir is phosphorylated by a virus-encoded phosphokinase only within HSV-infected cells.
   (C) Acyclovir selectively inhibits the RNA polymerase in the HSV virion.
   (D) Acyclovir specifically blocks the matrix protein of HSV, thereby preventing release of progeny HSV.
16. Each of the following statements concerning herpesvirus latency is correct *except*
   (A) Exogenous stimuli can cause reactivation of latent infection, with induction of symptomatic disease.
   (B) During latency, antiviral antibody is not demonstrable in the sera of infected individuals.
   (C) Reactivation of latent herpesviruses is more common in patients with impaired cell-mediated immunity than in immunocompetent patients.
   (D) Virus can be recovered from latently infected cells by cocultivation with susceptible cells.
17. Vaccines have been demonstrated to be efficacious in preventing herpesvirus disease in which one of the following situations?
   (A) Herpes simplex virus type 1 primary infection
   (B) Herpes simplex virus type 2 reactivation
   (C) Varicella-zoster reactivation
   (D) Cytomegalovirus primary infection
   (E) Epstein-Barr virus reactivation
18. Herpes simplex virus and cytomegalovirus share many features. Which one of the following features is *least* likely to be shared?
   (A) Important cause of morbidity and mortality in the newborn
   (B) Congenital abnormalities caused by transplacental passage
   (C) Important cause of serious disease in immunosuppressed individuals
   (D) Mild or inapparent infection
19. Herpes simplex virus type 1 (HSV-1) is distinct from herpes simplex virus type 2 (HSV-2) in several different ways. Which one of the following is the *least* accurate statement?
   (A) HSV-1 causes lesions above the umbilicus more frequently than HSV-2 does.
   (B) Infection by HSV-1 is not associated with any tumors in humans.
   (C) Antiserum to HSV-1 neutralizes HSV-1 much more effectively than HSV-2.
   (D) Whereas HSV-1 causes frequent recurrences, HSV-2 infection rarely recurs.
20. Each of the following statements concerning Epstein-Barr virus is correct *except*
   (A) Many infections are mild or inapparent.
   (B) The earlier in life primary infection is acquired, the more likely the typical picture of infectious mononucleosis will be manifest.
   (C) Latently infected lymphocytes regularly persist after an acute episode of infection.
   (D) Infection confers immunity against second episodes of infectious mononucleosis.

Answers

1. D	6. E	11. B	16. B
2. A	7. D	12. B	17. C
3. D	8. A	13. D	18. B
4. B	9. C	14. A	19. D
5. A	10. C	15. B	20. B

Hepatitis

REVIEW QUESTIONS

1. A 24-year-old woman in New York City is admitted to the hospital because of jaundice. On workup, she is found to have HCV infection. The major risk factor for HCV infection in the United States is
   (A) Tattoos
   (B) Injecting drug use
   (C) Blood transfusion
   (D) Sexual activity
   (E) Working in health care occupations
2. Which of the following exposures poses a risk for hepatitis infection?
   (A) A nurse sustains a needlestick while drawing up insulin to administer to an HBV-infected patient with diabetes.
   (B) While cleaning the bathroom, a housekeeper's intact skin has contact with feces.
   (C) An operating room technician with chapped and abraded hands notices blood under his gloves after assisting in an operation on a patient with HCV infection.
   (D) A child drinks out of the same cup as her mother, who has an HAV infection.
   (E) A shopper eats a sandwich prepared by a worker with an asymptomatic HBV infection.
3. An epidemic of jaundice caused by HEV occurred in New Delhi. HEV is
   (A) Found in rodents and pigs
   (B) A major cause of bloodborne hepatitis
   (C) The cause of a disease that resembles hepatitis C
   (D) Capable of establishing chronic infections
   (E) Associated with an increased risk of liver cancer
4. HDV (delta agent) is found only in patients who have either acute or chronic infection with HBV. The following is most correct
   (A) HDV is a defective mutant of HBV.
   (B) HDV depends on HBV surface antigen for virion formation.
   (C) HDV induces an immune response indistinguishable from that induced by HBV.
   (D) HDV is related to HCV.
   (E) HDV contains a circular DNA genome.
5. A 23-year-old woman is planning a 1-year trip through Europe, Egypt, and the Indian subcontinent and receives a vaccine for hepatitis A. The current hepatitis A vaccine is
   (A) A live attenuated virus vaccine
   (B) A recombinant DNA vaccine
   (C) A formalin-inactivated virus vaccine
   (D) An envelope glycoprotein subunit vaccine
   (E) A chimeric poliovirus that expresses HAV neutralizing epitopes
6. The following statements about HCV infection and associated chronic liver disease in the United States are correct *except*
   (A) HCV is responsible for 40% of chronic liver disease.
   (B) Chronic infection develops in most (70–90%) HCV-infected persons.
   (C) HCV-associated liver disease is the major cause for liver transplantation.
   (D) HCV viremia occurs transiently during early stages of infection.
   (E) HCV-infected patients are at high risk (5–20%) for liver cancer.
7. A middle-aged man complained of acute onset of fever, nausea, and pain in the right upper abdominal quadrant. There was jaundice, and dark urine had been observed several days earlier. A laboratory test was positive for HAV IgM antibody. The physician can tell the patient that
   (A) He probably acquired the infection from a recent blood transfusion.
   (B) He will probably develop chronic hepatitis.
   (C) He will be at high risk of developing hepatocellular carcinoma.
   (D) He will be resistant to infection with hepatitis E.
   (E) He may transmit the infection to family members by person-to-person spread for up to 2 weeks.
8. Several different viruses can cause hepatitis. One of the following statements applies to all four viruses: HAV, HCV, HDV, and HEV.
   (A) Contains a single-stranded RNA genome
   (B) Is transmitted primarily by the parenteral route
   (C) Is transmitted primarily by the fecal–oral route
   (D) Is associated with fulminant hepatitis
   (E) Undergoes sequence variation during chronic infection
9. A 30-year-old student goes to the emergency room because of fever and anorexia for the past 3 days. She appears jaundiced. Her liver is enlarged and tender. A laboratory test shows elevated aminotransferases. She reports a history of having received hepatitis B vaccine 2 years ago but has not had hepatitis

A vaccine. The results of her hepatitis serologic tests are as follows: HAV IgM-negative, HAV IgG-positive, HBsAg-negative, HBsAb-positive, HBcAb-negative, HCV Ab-positive. The most accurate conclusion is that she probably

(A) Has hepatitis A now, has not been infected with HBV, and had hepatitis C in the past
(B) Has hepatitis A now and has been infected with both HBV and HCV in the past
(C) Has been infected with HAV and HCV in the past and has hepatitis B now
(D) Has been infected with HAV in the past, has not been infected with HBV, and has hepatitis C now
(E) Has been infected with HAV and HCV in the past, has not been infected with HBV, and has hepatitis E now

10. A 36-year-old nurse is found to be both HBsAg positive and HBeAg positive. The nurse most likely

(A) Has acute hepatitis and is infectious
(B) Has both HBV and HEV infections
(C) Has a chronic HBV infection
(D) Has cleared a past HBV infection
(E) Was previously immunized with HBV vaccine prepared from healthy HBsAg-positive carriers

11. The following persons are at increased risk for HAV infection and should be routinely vaccinated except for which group?

(A) Persons traveling to or working in countries that have high levels of HAV infection
(B) Men who have sex with men
(C) Users of illegal drugs (both injecting and noninjecting)
(D) Persons who have an occupational risk for infection
(E) Persons who have a clotting factor disorder
(F) Susceptible persons who have chronic liver disease
(G) Teachers in elementary schools

12. There is global variation in the prevalence of HBV infection. Which of the following geographic areas has low endemicity (HBsAg prevalence of <2%)?

(A) Southeast Asia
(B) The Pacific Islands
(C) Eastern Europe
(D) Australia
(E) Sub-Saharan Africa

13. Which of the following persons are not recommended to receive hepatitis B vaccine because they have a risk factor for HBV infection?

(A) Sexually active persons who are not in long-term, mutually monogamous relationships
(B) Injection drug users
(C) Pregnant women
(D) Persons who live in a household with a person who is HBsAg positive
(E) Persons seeking treatment for a sexually transmitted disease

14. Which of the following statements regarding HBIG is not true?

(A) HBIG provides temporary protection when administered in standard doses.
(B) HBIG typically is used instead of hepatitis B vaccine for postexposure immunoprophylaxis to prevent HBV infection.
(C) No evidence exists that HBV, HCV, or HIV have ever been transmitted by HBIG in the United States.
(D) HBIG is not used as protection against HCV infection.

15. Each of the following statements concerning HAV is correct *except*

(A) The hepatitis A vaccine contains inactivated HAV as the immunogen.
(B) HAV commonly causes asymptomatic infection in children.
(C) The diagnosis of hepatitis A is usually made by isolating HAV in cell culture.
(D) Gamma globulin is used to prevent hepatitis A in exposed persons.

16. Which one of the following is the *most* reasonable explanation for the ability of HBV to cause chronic infection?

(A) Infection does not elicit the production of antibody.
(B) The liver is an "immunologically sheltered" site.
(C) Viral DNA can persist within the host cell.
(D) Many humans are immunologically tolerant to HBsAg.

17. A 35-year-old man addicted to intravenous drugs has been a carrier of HBsAg for 10 years. He suddenly develops acute fulminant hepatitis and dies within 10 days. Which of the following laboratory tests would contribute *most* to diagnosis?

(A) Anti-HBs antibody
(B) HBeAg
(C) Anti-HBc antibody
(D) Anti-delta virus antibody

18. Each of the following statements concerning HCV and HDV is correct *except*

(A) HCV is an RNA virus that causes posttransfusion hepatitis.
(B) HDV is transmitted primarily by the fecal–oral route
(C) HDV is a defective virus that can replicate only in a cell that is also infected with HBV.
(D) People infected with HCV commonly become chronic carriers of HCV and are predisposed to hepatocellular carcinoma.

19. Which of the following statements about HBV is *false?*

(A) Replication involves reverse transcriptase.
(B) Infected persons may have large numbers of noninfectious viral particles circulating in their bloodstream.
(C) Infection can result in cirrhosis.
(D) Asymptomatic infections can last for years.
(E) In the United States, the incidence of infection has been steadily increasing over the past few years.

Answers

1. B	6. D	11. G	16. C
2. C	7. E	12. D	17. D
3. A	8. A	13. C	18. B
4. B	9. D	14. B	19. E
5. C	10. A	15. C	