

GENERAL BACTERIOLOGY TEST
30 Minutes

1. The growth rate of bacteria during the exponential phase of growth is
 - a-Zero
 - b-Increasing**
 - c-Constant
 - d-Decreasing
 - e- Negative

2. Transfer of a donor chromosome fragment by a temperate bacterial virus is defined as
 - a-Conjugation
 - b-Recombination
 - c-Competence
 - d-Transformation
 - e-Transduction**

3. Treatment of the culture with gentamicin, an inhibitor of protein synthesis, would have maximal effect on which of the phases?
 - a-Lag phase
 - b-Log phase**
 - c-Stationary phase
 - d-Death phase
 - e- Static phase

4. A bacterium is examined and is found to lack superoxide dismutase, catalase, and peroxidase. Which of the following statements best describes this bacterium?
 - a-This bacterium is an anaerobe**
 - b-This bacterium will survive in an O₂ environment
 - c-This bacterium is more virulent than one containing the three enzymes
 - d-This bacterium does not produce superoxide
 - e-This bacterium does not produce peroxide.

6. Iron is essential in bacterial metabolism. When bacteria invade the human host they must capture iron in order to survive. Which of the macromolecules listed below is important in bacterial iron metabolism?
 - a-Transferrin
 - b- Lactoferrin
 - c- Ferric oxide
 - d- Lipopolysaccharide (LPS)
 - e- Siderophores**

7. A 65-year-old man develops dementia, progressive over several months, along with ataxia and somnolence. An electroencephalographic pattern shows paroxysms with high voltages and slow waves, suggestive of Creutzfeldt-Jakob disease (OD). By which of the following agents is this disease caused?

a-Bacterium

b- Virus

c- Viroid

d- Prion

e- Plasmid

8. Group A streptococci are the most common bacterial cause of pharyngitis in school-age children 5-15 years of age. The most important cell component involved in adherence of this bacteria to fibronectin, which covers the epithelial surface of the nasopharynx is

a-Capsule

b- Flagella

c-Lipoprotein

d-antigen

e- Lipopolysaccharide

f- Lipotechoic acid

9. In the fall of 2001, a series of letters containing spores of *Bacillus anthracis* were mailed to members of the media and to U.S. Senate offices. The result was 22 cases of anthrax, with five deaths. The heat resistance of bacterial spores, such as those of *Bacillus anthracis*, is partly attributable to their dehydrated state and partly to the presence of large amounts of:

a- Calcium dipicolinate/ dipicolinic acid

b-Glutamic acid

c- Sulfhydryl-containing proteins.

d-Diaminopimelic acid

e- Lipid A

10. Organisms that are capable of growth at such high temperatures are referred to:

a-Mesophiles

b-Psychrophiles

c-Halophile

d-Thermophilic

e-Microaerophilic

11. A 26-year-old woman visits her physician because of an unusual vaginal discharge. On examination, the physician observes a thin, homogeneous, white-gray discharge that adheres to the vaginal wall. The pH of the discharge is 5.5 (normal, <4.3). On Gram stain, many epithelial cells covered with gram-variable rods are seen. Bacterial vaginosis is diagnosed. Which one of the following normal genital flora microorganisms is greatly decreased in bacterial vaginosis?

a-Corynebacterium species

b-Staphylococcus epidermidis

c-Prevotella species

d- Candida albicans

e-Lactobacillus species

12. Dental plaque and periodontal disease can be thought of as a continuum of what type of physiological process?

- a-Biofilm formation** b-Normal aging c-Abnormal digestion
d-Exaggerated immune response e-Chewing gum

13. Which one of the following microorganisms is closely associated with dental caries?

- a- albicans **b-Streptococcus mutans** c-Pseudomonas
d-Neisseria e-Staph epidermidis

14. Which of the following content is present in periplasmic space?

- a- Genetic material such as DNA or RNA b- Lipid A c- LPS
d-Teichoic acid. **e- Hydrolytic enzymes such as B-lactamases**

15. Certain bacterial infectious diseases are diagnosed by detecting antibodies in patient's serum. Which of the following bacterial cell component is highly antigenic in nature?

- a-Capsule** b-Flagellae c-Endospore
d-Plasmid e-Peptidoglycan

16. Which of the following statements about lipopolysaccharide is correct?

- a-It interacts with macrophages and monocytes yielding release of cytokines.**
b-It does not cause endotoxic shock
c-It forms holes in red blood cell membranes yielding hemolysis.
d-It causes hypothermia.
e- It causes paralysis.

17. Your superior requests that you sterilize some surgical instruments. Which one of the following agents would you use?

- a- Benzoic acid (2%) b- Isopropyl alcohol (2%) **c- Glutaraldehyde (2%)**
d- Hydrogen peroxide (2%) e- Quaternary ammonium compound (2%)

18. Which of the following is the most resistant to destruction by chemicals and heat?

- a-Spores of *Aspergillus fumigatus*. b-*Mycobacterium tuberculosis*
c- Ebola virus d- *E. coli* **e- Spores of *Bacillus anthracis*.**

19. A 10-week old infant is diagnosed with meningitis. A lumbar puncture reveals numerous neutrophils and gram positive rods. She is admitted to the hospital and is thought to be allergic to beta lactate drugs. Which of the following antibiotics attaches to 50S RIBOSOME?

- a-Ampicillin b- Amphotericin **c- Chloramphenicol**
d- Penicillin e- Trimethoprim

20. Alcohol is denaturant that rapidly kills bacteria when applied in aqueous solution in range of;
a-10-30% b-50-60 % **c-70-75%** d-95-100%

21. For Sterilization of heat sensitive surgical instruments and sutures, which of the following sterilization method is most appropriate?

- a-Biphenol b- Formalin **c- Ethylene oxide**
d- Gentian violet e- Acriflavin

22. A surgeon washed up for an operation of appendix. To take standard precautions nurse provided him pre-sterilized cap, mask, gowns and gloves in a plastic bag. These items were sterilized by;

- a-Boiling at 100°C b- In hot air oven **c- Autoclaving**
d- Tyndallization e- Pateurization

23. Which one of the following drugs inhibits bacterial nucleic acid synthesis by blocking the production of tetrahydrofolic acid?

- a-Ceftriaxone** b- Erythromycin c- Metronidazole
d- Rifampin e- Trinethoprim

24. Regarding endotoxin, which statement is most accurate?

- a-The endotoxin is polypeptide, its toxic portion has two O-alanine
b-Endotoxin is produced by both gram negative and gram positive bacteria
c-Endotoxin acts by binding to MHC-2 molecule
d-Endotoxins are destroyed at 60°C
e-Endotoxins induce fever and hypotension by release of interleukin 1 and tumor necrosis factor

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- a. Ceftriaxone**
b. Erythromycin
c. Metronidazole
d. Rifampin
e. Trimethoprim

SPECIAL BACTERIOLOGY -1
Gram Positive Cocci / Rods & Gram Negative Cocci.

1- An 11 year old boy develops a mild fever and pain in his upper arm. A radiograph of his arm shows a lytic lesion (dissolution) in the upper part of the humerus with periosteal elevation over the lesion. The patient is taken to the surgery, where the lesion is debrided(dead bone pus removed). Culture from the lesion yields gram-positive cocci. A test shows that the organism is a staphylococcus and not a streptococcus. Based on this information, you know the organism is:

- a) Susceptible to nafcillin.
- b) Beta-Lactamase positive
- c) A producer of protein A
- d) Encapsulated
- e) **Catalase positive**

2- A 36-years old male patient has an abscess with a strain of staphylococcus aureus that is beta lactamase positive. This indicates that the organism is resistant to which of the following antibiotics?

- a) **Penicillin G, ampicillin, and piperacillin.**
- b) Trimethom-sulfamethoxazole
- c) Erythromycin, Clarithromycin, and azithromycin
- d) Vancomycin
- e) Cefazolin and ceftriaxone

3- A group of six children younger than 8 years of age live in a semitropical country. Each of the children has several crusted weeping skin lesions of impetigo (pyoderma). The lesions are predominantly on the arms and face. Which of the following microorganisms is a likely cause of the lesions?

- a) Escherichia coli
- b) Chlamydia trachomatis
- c) **Staphylococcus aureus**
- d) Streptococcus pneumoniae
- e) Bacillus anthracis

4- Seven days ago, A 27 years old medical student returned from Central America, where she had spent the summer working in clinic for indigenous people, four years ago, she developed a erythematous sunburn-like rash, headache, muscle aches and abdominal cramps with diarrhea. Her blood pressure is 70/40 mm Hg. Pelvic examination shows she is having her menstrual period with a tampon in place; otherwise, the pelvic examination is normal. Her kidney function test (serum urea nitrogen and creatinine) results are abnormal, indicating mild renal failure. A blood smear for malaria is negative. Her illness is likely to be caused by which of the following?

- a) A toxin that results in greatly increased levels of intracellular cyclic adenosine monophosphate (cAMP)

- b) A toxin that degrades sphingomyelin
- c) A toxin that binds to the class II major histocompatibility complex (MHC) and act as superantigen**
- d) A two-component toxin that forms pores in white blood cells and increases cation permeability
- e) A toxin that blocks elongation factor 2 (EF2)

5. A 16-year-old bone marrow transplant patient has a central venous line that has been in place for 2 weeks. He also has a urinary tract catheter, which has been in place for 2 weeks as well. He develops fever while his white blood cell count is very low and before the transplant has engrafted. Three blood cultures are done, and all grow Staphylococcus epidermidis. Which one of the following statements is correct?

- a) The Staphylococcus epidermidis organisms are likely to be susceptible to penicillin G.
- b) The Staphylococcus epidermidis organisms are likely to be from the surface of the urinary tract catheter.
- c) The Staphylococcus epidermidis organisms are likely to be resistant to vancomycin.
- d) The Staphylococcus epidermidis organisms are likely to be from a skin source.
- e) The Staphylococcus epidermidis organisms are likely to be in a biofilm on the central venous catheter surface.**

6. Which of the following statements regarding the role of protein A the pathogenesis of infections caused by Staphylococcus aureus is correct?

- a) It is responsible for the rash in toxic shock syndrome.
- b) It converts hydrogen peroxide into water and oxygen.
- c) It is a potent enterotoxin.
- d) It is directly responsible for lysis of neutrophils.
- e) It is a bacterial surface protein that binds to the Fc portion of IgG.**

7. Which of the following staphylococcal organisms does not produce coagulase and has been implicated in urinary tract infections?

- | | |
|--|-------------------------------|
| a)-Staphylococcus Intermedicus | b)-Staphylococcus epidermidis |
| c)-Staphylococcus saprophyticus | d)Staphylococcus hominis |
| e)- Staphylococcus hemolyticus | |

8. All of the following are important infection control strategies in containing spread of MRSA in hospitals except:

- a) Aggressive hand hygiene
- b) Routine surveillance for nasal colonization among high risk individuals
- c) Contact isolation for patients who are colonized or infected with MRSA
- d) Routine antimicrobial prophylaxis for all patients hospitalized for more than 48 hours**
- e) Aseptic management of skin lesions

9. A 48-year-old alcoholic man is admitted to a hospital because of stupor. He is unkempt and homeless and lives with other homeless people, who called the authorities when he could not be easily aroused. His temperature is 38.5°C, and his blood pressure 125/80 mm Hg. He moans when attempts are made to arouse him. He has positive Kernig and Brudzinski signs, suggesting meningeal irritation. Chest radiography shows left lower lobe lung consolidation. An endotracheal aspirate yields rust-colored sputum. Examination of a Gram-stained sputum smear shows numerous polymorphonuclear cells and gram-positive lancet-shaped diplococci.

Based on this information, the likely diagnosis is.

- a) Pneumonia and meningitis caused by *Staphylococcus aureus*
- b) Pneumonia and meningitis caused by *Streptococcus pyogenes*
- c) Pneumonia and meningitis caused by *Streptococcus pneumoniae***
- d) Pneumonia and meningitis caused by *Enterococcus faecalis*
- e) Pneumonia and meningitis caused by *Neisseria meningitidis*

10. An 8-year-old boy develops a severe sore throat. On examination, a grayish-white exudate is seen on the tonsils and pharynx. The differential diagnosis includes group A streptococcal infection, Epstein-Barr virus infection, severe adenovirus infection, and diphtheria. The cause of the boy's pharyngitis is most likely

- a) Catalase-negative gram-positive coccus, *Streptococcus pyogenes***
- b) A single-stranded positive-sense RNA virus
- c) A catalase-positive gram-positive coccus that grows in grape-like clusters
- d) *Staphylococcus epidermidis*
- e) A double-stranded RNA virus

11. Important methods for classifying and spectating streptococci are

- a) Agglutination using antisera against the cell wall group-specific substance
- b) Biochemical testing
- c) Hemolytic properties (α, β, nonhemolytic)
- d) Capsular swelling (quellung) reaction
- e) All of the above**

12. All of the following statements regarding capsule of *S. pyogenes* are correct except:

- a) It is responsible for the mucoid appearance of the colonies in vitro.
- b) It is antiphagocytic.
- c) It binds to CD44 on human epithelial cells.
- d) It is an important virulence factor.
- e) A vaccine against the capsule is currently available.**

13. An 8-year-old girl develops chorea with rapid uncoordinated facial tics and involuntary purposeless movements of her extremities, strongly suggestive of acute rheumatic fever. She has no other major manifestations of rheumatic fever (carditis, arthritis, subcutaneous nodules, skin rash). The patient's throat culture is negative for *Streptococcus pyogenes* (group A streptococci). However, she, her brother, and her mother all had sore throats 2 months ago. A test that if positive would indicate recent *S. pyogenes* infections is

- a) Antistreptolysin S antibody titer
- b) Polymerase chain reaction for antibodies against M protein
- c) **ASO antibody titer**
- d) Esculin hydrolysis
- e) Antihyaluronic acid antibody titer

14. Enterococci can be distinguished from non-enterococcal group D streptococci on the basis of which of the following characteristics?

- a) γ -Hemolysis
- b) Esculin hydrolysis
- c) **Growth in 6.5% NaCl**
- d) Growth in the presence of bile
- e) Gram stain morphology

15. The inhabitants of a group of small villages in rural subSaharan Africa experienced an epidemic of meningitis. Ten percent of the people died, most of them younger than the age of 15 years. The microorganism that most likely caused this epidemic was:

- a) *Streptococcus agalactiae*
- b) *Escherichia coli* K1
- c) *Haemophilus influenzae*
- d) ***Neisseria meningitidis***
- e) West Nile virus

16. Which of the following cell components produced by *Neisseria gonorrhoeae* is responsible for attachment to host cells?

- a. lipo-oligosaccharide
- b. **Pili (fimbriae)**
- c. IgA protease
- a) Outer membrane porin protein
- b) Iron-binding protein

17. A 25-year-old sexually active woman presents with purulent vaginal discharge and dysuria 7 days after having unprotected sexual intercourse with a new partner. Gram negative diplococci are the top differentials. Of the choices below, what is the most sensitive diagnostic method for determining the likely etiologic agent?

- a. Gram stain
- b. An enzyme immunoassay
- c. Bacterial culture on selective media
- d. **A nucleic acid amplification test**
- e. Serology

18. A 20-year-old man with severe chronic lung disease presents with fever, cough productive of purulent sputum, and worsening hypoxemia. A sputum sample is collected, and the specimen is sent promptly to the laboratory. Microscopic examination of a Gram stain reveals numerous polymorphonuclear leukocytes and predominately gram-negative diplococci. The organism grows well on chocolate agar. What is the most likely organism causing this man's illness?

- a) *Neisseria gonorrhoeae*
- b) *Neisseria lactamica*
- c) *Moraxella catarrhalis*
- d) *Haemophilus ducreyi*
- e) ***Neisseria meningitidis***

19. A 25-year-old woman presents with septic arthritis of the knee. The fluid aspirate grows a gram-negative diplococcus on chocolate agar after 48 hours of incubation. The isolate is oxidase positive and oxidizes glucose but not maltose. Toot suspect infection with:

- a) *Neisseria meningitidis*
- b) *Neisseria lactamica*
- c) *Moraxella catarrhalis*
- d) ***Neisseria gonorrhoeae***
- e) None of the above

20. All of the following are virulence factors associated with *N. gonorrhoeae* except

- a) Pili
- b) Por proteins
- c) Lipooligosaccharide
- d) Opa proteins
- e) **A thick polysaccharide capsule**

21. A neonate after 24 hours of delivery presented in emergency department with high grade fever and poor feeding. On examination he was semi-conscious with neck stiffness. Lumbar puncture was done and microscopy of the CSF showed gram negative rods. What is your diagnosis

- a) Group B streptococci
- b) ***E. coli***
- c) *Klebsiella*
- d) *Pseudomonas*
- e) *Proteus*

22. A 20 year old male has wisdom tooth extraction diagnosed with bacterial endocarditis. He has congenital heart disease. Which is the most likely organism?

- a) *Staphylococcus aureus*
- b) *Staphylococcus epidermidis*
- c) *Streptococcus pneumoniae*
- d) ***Streptococcus viridans***
- e) *Enterococcus faecalis*

23. A 65 year old male presents with cold like symptoms for last 3 days. He also has chills, chest pain, and productive cough with bloody sputum. Blood agar reveals alpha hemolytic colonies. If quelling test is done. Which of the following is the most likely cause?

- a) Corynaebacterium
- b) Enterobacterspp
- c) Hemophilus
- d) Neisseria
- e) **Streptococcus pneumonia**

24. A 25Year old woman was well until the sudden onset of fever with several skin lesion (purpura). The lesions are scattered over body and are not raised. Her blood pressure is 60/10. Blood culture grew gram negative diplococcic. Which is he most likely agent?

- a) **Neisseria meningitides**
- b) E.coll
- c) Streptococcus pneumonia
- d) Listeria
- e) H. Influenzae

25. An 18-year-old woman who reports unprotected sex with a new partner 2 weeks previously develops fever and left lower quadrant abdominal pain with onset in association with her menstrual period. On pelvic examination in the emergency department, she has bilateral.tenderness when the uterus is palpated. A mass 2-3 cm in diameter is felt on the left, suggestive of tubo-ovarian abscess. Subsequently, Neisseria gonorrhoeae is cultured from her endocervix. The diagnosis is gonococcal pelvic inflammatory disease. A common sequela or complication of this infection is:

- a) Cancer of the cervix
- b) Urethral stricture
- c) Uterine fibroid tumors
- d) **Infertility**
- e) Vaginal-rectal fistula

26. A food commonly associated with Bacillus cereus food poisoning is:

- a) **Fried reheated rice**
- b) Baked potato
- c) Hot freshly steamed rice
- d) Green beans
- e) Honey

27. Tetanus toxin (tetanospasmin) diffuses to terminals of inhibitory cells in the spinal cord and brainstem and blocks which of the following?

- a) Release of acetylcholine
- b) Cleavage of SNARE proteins
- c) Release of inhibitory glycine and γ -aminobutyric acid**
- d) Release of Protective Antigen
- e) Activation of acetylcholine esterase

28. *Listeria monocytogenes* is frequently a foodborne pathogen because:

- a) It can survive at 4°C.**
- b) It survives under conditions of low pH.
- c) It survives in the presence of high salt concentrations.
- d) All of the above are correct.
- e) None of the above is correct

29. Which one of the following sets of bacteria causes diseases characterized by pseudomembrane?

- a) *Bacillus anthracis* and *Listeria*
- b) *Bacillus cereus* and *Clostridium perferingens*
- c) *Bacillus cereus* and *Clostridium tetani*
- d) *Corynebacterium diphtheria* and *Clostridium difficile***
- e) *Corynebacterium diphtheria* and *Listeria*

30. A housewife who lives on a small farm is brought to the emergency department complaining of double vision and difficulty talking. Within the past 2 hours, she noted a dry mouth and generalized weakness. Last night she served home-canned green beans as part of the meal. She tasted the beans before they were boiled. None of the other family members are ill. On examination, there is symmetrical descending paralysis of the cranial nerves, upper extremities, and trunk. The correct diagnosis is which one of the following?

- a) Tetanus
- b) Strychnine poisoning
- c) Botulism**
- d) Morphine overdose
- e) Ricin intoxication

SPECIAL BACTERIOLOGY 2

1. A 20-year-old college student goes to the student health center because of dysuria, frequency, and urgency on urination for 24 hours. She has recently become sexually active. On urinalysis, many polymorphonuclear cells are seen. The most likely organism responsible for these symptoms and signs is:

- a) Streptococcus agalactiae
- b) Gardnerella vaginalis
- c) Staphylococcus aureus
- d) Lactobacillus species
- e) Escherichia coli**

2. A 27-year-old woman is admitted to the hospital because of fever, with increasing anorexia, headache, weakness, and altered mental status of 2 days' duration. She works for an airline as a cabin attendant. Ten days before admission, she had a diarrhea! illness that lasted for about 36 hours. She has been constipated for the past 3 days. Her temperature is 39°C, heart rate is 68 beats/ min, blood pressure is 120/80 mm Hg, and respirations are 18 breaths/min. She knows who she is and where she is but does not know the date. She is picking at the bedclothes. Rose spots are seen on her trunk. Blood cultures are done, and most likely cause of her illness is:

- a) Enterotoxigenic Escherichia coli (ETEC)
- b) Shigella sonnei
- c) Salmonella Typhimurium
- d) Salmonella Typhi**
- e) Salmonel Enteroinvasive Escherichia coli (EIEC)

3. A 37-year-old woman with a history of urinary tract infections comes to the emergency department with burning on urination along with frequency and urgency. She says her urine smells like ammonia. The cause of her urinary tract infection is likely to be:

- a) Enterobacter aerogenes
- b) Proteus mirabilis**
- c) Citrobacter freundii
- d) Escherichia coli
- e) Serratia marcescens

4. 4-year-old boy from Kansas City who recently started attending preschool and after-school daycare is brought to his pediatrician for a diarrhea illness characterized by fever to 38.2°C, severe lower abdominal pain, and initially watery diarrhea. His mother became concerned because the stools are now blood tinged 24 hours into the illness, and the child appears quite ill. The mother reports that two other children who attend the same after-school daycare have recently had diarrhea! disease, one of whom likewise had bloody stools. Which of the following is the most likely pathogen causing the illness in these children?

- a) An enterotoxigenic strain of *Escherichia coli*
- b) *Salmonella Typhi*
- c) **Shigella**
- d) *Edwardsiella tarda*
- e) *Klebsiella oxytoca*

5. A 5-year-old girl attended a birthday party at a local fast food restaurant. About 48 hours later, she developed cramping abdominal pain and a low-grade fever. She is taken to a local emergency department and appears pale and lethargic. She has a temperature of 38°C, hypotensive and tachycardic. Abdominal examination reveals tenderness in the lower quadrants. He has serum creatinine of 2.0 mg/dL, a serum hemoglobin of 8.0 mg,/dL, thrombocytopenia, and evidence of hemolysis. What is the most likely pathogen causing this child's illness?

- a) **Escherichia coli O157:H7**
- b) *Salmonella Typhimurium*
- c) Enteropathogenic *Escherichia coli*
- d) *Edwardsiella tarda*
- e) Shigellosis

6. A 55-year-old homeless man with alcoholism presents with severe multilobar pneumonia. He requires intubation and mechanical ventilation. A Gram stain of his sputum reveals numerous polymorphonuclear leukocytes and gram-negative rods that appear to have a capsule. The organism is a lactose fermenter on MacConkey agar and is very mucoid and non-motile. What is the most likely organism causing this man's illness?

- a) *Serratia marcescens*
- b) *Enterobacter aerogenes*
- c) *Proteus mirabilis*
- d) ***Klebsiella pneumoniae***
- e) *Morganella morganii*

7. A young woman presents with recurrent urinary tract infections caused by *Proteus mirabilis* strain. What is the major concern?

- a) She does not take her medication.
- b) She is pregnant because pregnant patients are more susceptible to UTIs.
- c) **She has a bladder or kidney stone.**
- d) Her partner is infected.
- e) She has occult diabetes and should have a glucose tolerance test.

8. A 37-year-old firefighter sustains smoke inhalation and is hospitalized for ventilatory support. He has a severe cough and begins to expectorate purulent sputum. Gram stain of his sputum specimen shows numerous polymorphonuclear cells and numerous Gram-negative rods. Sputum culture grows numerous Gram-negative rods that are oxidase positive. They grow well at 42°C. On clear agar medium, they produce a green color in the agar. The agar where the green color is located fluoresces when exposed to ultraviolet light. The organism causing the patient's infection is ?

- a) **Pseudomonas aeruginosa**
- b) *Klebsiella pneumoniae*
- c) *Escherichia coli*
- d) *Burkholderia cepacia*
- e) *Burkholderia pseudomallei*

9. Long-term carriage and shedding is most likely to occur after gastrointestinal infection with which of the following species?

- a) *Escherichia coli* O157:H7
- b) *Shigella dysenteriae*
- c) *Vibrio cholerae*
- d) *Campylobacter jejuni*
- e) ***Salmonella typhi***

10. A 63 year-old man visited his favorite oyster restaurant. He ate two dozen oysters. Two days later, he was admitted to the hospital because of an abrupt onset of chills, fever, and lightheadedness when he stood up. His blood pressure was 60/40 mm Hg. He developed erythematous skin lesions that rapidly evolved into hemorrhagic bullae, which then formed ulcers. A microorganism of major concern for this patient is:

- a) ***Vibrio vulnificus***
- b) *Escherichia coli*
- c) *Salmonella typhi*
- d) *Clostridium perfringens*
- e) *Streptococcus pyogenes* (group A streptococci)

11. Bacteremia associated with a gastrointestinal infection is most likely to occur with which of the following?

- a) ***Salmonella typhi***
- b) *Vibrio cholerae*
- c) *Shigella boydii*
- d) *Vibrio parahaemolyticus*
- e) *Campylobacter jejuni*

12. An 18-year-old woman in rural Bangladesh develops profuse (8 L/d) diarrhea, organism growing well on TCBS agar. She has no symptoms other than the diarrhea and the manifestations of the fluid and electrolyte loss caused by the diarrhea. The most likely cause of her diarrhea is:

- a) *Campylobacter jejuni*
- b) Enterotoxigenic *Escherichia coli*
- c) *Salmonella typhimurium*
- d) *Vibrio cholerae***
- e) *Shigella dysenteriae*

13. A 45-year-old man develops a gastric ulcer that can be visualized on a contrast medium—enhanced radiograph of his stomach. A biopsy specimen is taken from the gastric mucosa at the site of the ulcer. A presumptive diagnosis can be reached most rapidly by inoculating part of the specimen on which of the following?

- a) A medium containing urea**
- b) A medium containing vancomycin, polymyxin B, and trimethoprim incubated at 42°C
- c) MacConkey agar medium incubated at 37°C
- d) Thiosulfate-citrate-bile-sucrose medium incubated at 42°C
- e) Blood agar medium incubated at 37°C

14. 3-month-old infant is brought to the pediatric emergency department in severe respiratory distress. The child appears dehydrated, and there is a prominent peripheral lymphocytosis. The chest radiograph reveals perihilar infiltrates. The child's grandmother, who watches the infant now that the mother has returned to work, has had a dry hacking cough for about 2 weeks. The most likely causative agent is:

- a) *Haemophilus influenzae* type b
- b) *Bordetella pertussis***
- c) *Streptococcus agalactiae*
- d) *Chlamydia pneumoniae*
- e) *Bordetella*

15. Medical physicians working in a refugee camp in southern Punjab were receiving young children with high fever, bloody diarrhea & dehydration. Because of the remoteness of site only limited laboratory studies were available. The suspected organism was a non-motile, Gram-negative non-lactose fermenting colonies on Salmonella Shigella agar. Based on these findings, which disease is more likely?

- a) Bacillary dysentery**
- b) Infection due to *Campylobacter jejuni*
- c) Cholera (O:1 classic biotype)
- d) Non-typhoidal salmonellosis
- e) Staphylococcal food poisoning

16. A person ate ham burger at dinner. Next day he had bloody diarrhea along with anuria. Gram stain of the stool showed gram negative rods. Culture showed lactose fermenting colonies on macConkey agar. What would be the reaction of the organism on TSI agar?

- a) **Acid slant, acid butt, GAS(+) H₂S(-)**
- b) Alkaline slant, acid butt GAS(-) H₂S (-)
- c) Alkaline slant, alkaline butt GASH H₂S(-)
- d) Alkaline slant, acid butt GASH H₂S(+)
- e) Acidic slant, alkaline butt GAS(+) H₂S(+)

17. A 60-year-old man has a 5-month history of progressive weakness and a weight loss of 13 kg along with intermittent fever, chills, and a chronic cough productive of yellow sputum, occasionally streaked with blood. A sputum specimen is obtained, and numerous acid-fast bacteria are seen on the smear. Culture of the sputum is positive for M tuberculosis. Which treatment regimen is most appropriate for initial therapy?

- a. Isoniazid and rifampin
- b. Sulfamethoxazole—trimethoprim and streptomycin
- c. **Isoniazid, rifampin, pyrazinamide, and ethambutol**
- d. Isoniazid, cycloserine, and ciprofloxacin
- e. Rifampin and streptomycin

18. A 47-year-old woman presents with a 3-month history of progressive cough, weight loss, and fever. Chest radiography shows bilateral cavitary disease suggestive of tuberculosis. Sputum culture grows an acid fast bacillus that is a photochromogen (an orange pigment when exposed to light). The organism most likely is:

- a. Mycobacterium tuberculosis
- b. **Mycobacterium kansasii**
- c. Mycobacterium gordonae
- d. Mycobacterium avium complex
- e. Mycobacterium fortuitum.

19. A 31-year-old Asian woman is admitted to the hospital with a 7-week history of increasing malaise, myalgia, non-productive cough, and shortness of breath. She has daily fever of 38-39°C and a recent 5-kg weight loss. She had a negative chest radiograph when she entered the United States 7 years ago. The patient's grandmother died of tuberculosis when the patient was an infant. A current chest radiograph is normal; results of other tests show a decreased hematocrit and liver function test abnormalities. Liver and bone marrow biopsies show granulomas with giant cells and acid-fast bacilli. She is probably infected with

- a. Mycobacterium leprae
- b. Mycobacterium fortuitum
- c. Mycobacterium ulcerans
- d. Mycobacterium gordonae
- e. **Mycobacterium tuberculosis**

20. Which of the following statements about the purified protein derivative (PPD) and the tuberculin skin test is most correct?

- a. It is strongly recommended that medical and other health science students have PPD skin tests every 5 years
- b. Persons immunized with BCG rarely, if ever, convert to positive PPD skin test results.
- c. The intra-dermal skin test is usually read 4 hours after being applied.
- d. A positive tuberculin test result indicates that an individual has been infected with M tuberculosis in the past and may continue to carry viable mycobacteria.**
- e. A positive PPD skin test result implies that a person is immune to active tuberculosis

21. A 10-year-old child has a primary pulmonary M tuberculosis infection. Which of the following features of tuberculosis is most correct?

- a. In primary tuberculosis, an active exudative lesion develops a. rapidly spreads to lymphatics and regional lymph nodes.**
- b. The exudative lesion of primary tuberculosis often heals slowly.
- c. If tuberculosis develops years later, it is a result of another exposure to M tuberculosis.
- d. In primary tuberculosis, all of the infecting M tuberculosis organisms are killed by the patient's immune response
- e. In primary tuberculosis, the immune system is primed, but the PPD skin test result remains negative until there is a second exposure to M tuberculosis.

22. A 12-year-old Boy Scout went to summer camp for 2 weeks in late August. When he returned home, his mother noticed a bull's-eyeshaped rash on the back of her son's left calf. Shortly after Labor Day, the boy developed a flulike illness that resolved after 4 days of bed rest. Three weeks later, the boy complained to his mother that his body hurt all over whenever he moved. This prompted a visit to the pediatrician, who ordered an infectious disease workup. What is the most likely source of the boy's infection?

- a. Respiratory transmission from another sick camper
- b. Ingestion of urine-contaminated water from a stream
- c. The bite of a mosquito harboring a parasite
- d. Ingestion of faecally contaminated food
- e. The bite of a borrelia-infected tick**

23. Nontreponemal serological tests:

- a. Are useful in definitively identifying a Treponema pallidum infection.
- b. Measure antibodies against Treponema pallidum.
- c. can be used to monitor antibiotic treatment of primary or secondary syphilis
- d. Reagin antibodies in serum reacts with cardiolipin from beef heart**
- e. Are useful in diagnosing a disseminated gonococcal infection.

24. A 42-year-old woman went camping in the Sierra Nevada Mountains, where she slept for two nights in an abandoned log cabin. After the second night, a tick was found on her shoulder. Six days later, she developed fever to 38°C, which lasted for 4 days. Ten days later, she had another similar episode of fever. Examination of a blood smear stained with Wright stain showed spirochetes suggestive of *Borrelia* species. Which of the following statements about relapsing fever is correct?

- a. Each relapse is associated with an antigenically distinct variant.
- b. Blood smears should be made when the patient is afebrile.
- c. *Borrelia* is not a spirochete.
- d. The main reservoir for the *Borrelia* is cat.
- e. *Borrelia* is resistant to penicillin and tetracycline.

25. An 18-year-old sexually active woman develops left lower quadrant pain and fever. On pelvic examination, she has tenderness in the left adnexa, and a mass suggestive of a uterine tube abscess is palpated. The patient is diagnosed with pelvic inflammatory disease. Which of the following bacteria is considered to be a common cause of pelvic inflammatory disease?

- a. *Bacillus cereus*
- b. *Haemophilus influenzae*
- c. *Neisseria*
- d. *Mycoplasma pneumoniae*
- e. ***Chlamydia trachomatis***

26. A 19-year-old man develops cough and fever. A chest radiograph shows consolidation of the left lower lobe. A diagnosis of pneumonia is made. Which of the following bacteria is a frequent cause of community-acquired pneumonia?

- a. *Legionella pneumophila*
- b. *Chlamydia pneumoniae*
- c. None of the above
- d. *Mycoplasma pneumoniae*
- e. ***Klebsiella pneumoniae***

27. Middle-aged sportsman, a resident of Oklahoma, took a hike through a rural wooded and brushy area near his home. The next morning, he noticed and removed a large (>1 cm) tick from his upper arm. About 1 week later, he experienced gradual onset of fever and malaise. He now seeks medical attention because he is concerned about a possible infection transmitted by the tick. Which of the following diseases is most likely to be acquired from a tick?

- a. Dengue
- a. **Rocky Mountain spotted fever**
- b. Typhus
- c. Yellow fever
- d. Malaria.

28. Chlamydia pneumoniae pneumonia most resembles infection caused which of the following organisms?

- a. Streptococcus pneumonia
- b. Mycoplasma pneumonia**
- c. Haemophilus influenzae
- d. Chlamydia trachomatis
- e. Rhinovirus

29. PPD is an antigen derived from:

- a. Pseudomonas putida
- b. Pseudomonas aeruginosa
- c. Bordetella pertussis
- d. Mycoplasma pneumonia
- e. Mycobacterium tuberculosis**

30. A patient was received in emergency department with complaints of low grade fever, chronic cough, night sweats and body aches. Mycobacterium tuberculosis was among the top differentials. Which media is used to culture this pathogen?

- a. Loeffler's medium
- b. Löwenstein-Jensen media**
- c. Tellurite medium
- d. Chocolate agar
- e. Blood agar

31. A Patient with leonine (lion-like) facies and hypo-pigmented macular skin lesions came to the medical outpatient department. He was suspected to have leprosy. Mycobacterium leprae is stained by which of the following technique in a basic health unit laboratory?

- a. Modified ZN staining with weak acid**
- b. PAS staining
- c. Albert staining
- d. Rhodamine-auramine staining technique
- e. Gram staining technique

32. A man who has a penile chancre appears in a hospital's emergency service. The VDRL test is negative. Which of the following is the most appropriate course of action?

- a. Perform dark-field microscopy for treponemas**
- b. Perform a Gram stain on the chancre fluid.
- c. Repeat the VDRL test in 10 days
- d. Send the patient home untreated
- e. Swab the chancre and culture on Thayer-Martin agar

PARASITOLOGY

- 1. A sexually active 24-year-old woman complains of vaginal itching and vaginal discharge. To verify your tentative diagnosis of trichomoniasis, you should include which of the following in your workup?**
 - a) Specific serologic test
 - b) Ova and parasite fecal smear
 - c) Wet mount of vaginal fluid .**
 - d) Enzyme-linked immunoassay (ELISA) test of serum
 - e) Stool culture.

- 2. Which one of the following diagnostic tests should be conducted for the patient having amoebiasis?**
 - a) Blood and urine bacteriologic examination
 - b) Series of ova and parasite tests and fecal smears**
 - c) ELISA or hemagglutination serologic tests for malaria
 - d) Skin microfilarial test
 - e) Endoscopic exam for whipworms

- 3. An apparently fatigued but alert 38-year-old woman has spent 6 months as a teacher in a rural Thailand village school. Her chief complaints include frequent headaches, occasional nausea and vomiting, and periodic fever. You suspect malaria and indeed find parasites in red blood cells in a thin blood smear. To rule out the dangerous falciparum form of malaria, which one of the following is the best choice?**
 - a) Red blood cells containing trophozoites with Schuffner's dots
 - b) There is no ring stage present
 - c) Banana-shaped or crescent-shaped gametocytes**
 - d) Gametocytes are spherical
 - e) Parasites with single nuclei

- 4. A 52-year-old male, returning from a travel tour in India and Southeast Asia, was diagnosed with intestinal amoebiasis and successfully treated with iodoquinol. A month later, he returned to the clinic complaining of the following conditions. Which of the conditions is most extra-intestinal manifestation of amoebiasis?**
 - a) Liver abscess**
 - b) CNS disease
 - c) Intestinal flask shaped ulcer
 - d) Arthritis
 - e) Colonic abscess

- 5. Patient came to the emergency department with history of fever, shivering and body aches. Plasmodium vivax was diagnosed as a cause of malaria. This plasmodium is responsible for which type of malaria?**

- a) **Beningn tertian malaria**
 - b) Quartan malaria
 - c) Malignant tertian malaria
 - d) Benign Quartan malaria
 - e) All of the above
6. **A young boy had history of intermittent fever for last week, associated with dark black coloured urine. Which specie of Plasmodium is responsible for his disease?**
- a) **P. falciparum**
 - b) P.vivax
 - c) P.ovale
 - d) P.malariae
 - e) None of the above
7. **An HIV positive patient developed watery non-bloody diarrhea. His fecal smear revealed oocysts, stained positively with modified ZN staining technique. What is the most likely causative agent?**
- a) Toxoplasma gonodi
 - b) Giardia lamblia
 - c) Entamoeba histolytica
 - d) **Cryptosporidium**
 - e) Diphylobothrium latum
8. **A 35 year old adult had an official trip to India. After 3-6 months of returning he developed dry, rough and pigmented lesions on skin along with fever. On physical examination he had hepatosplenomegaly. Skin biopsy revealed LD bodies. What is the most likely diagnosis?**
- a) **Lesishmaniasis**
 - b) Black water fever
 - c) Infantile Kala-azar
 - d) Malaria
 - e) Amoebiasis
9. **A divorced working mother takes her 4 year old child to day care center. She has noticed that the child's frequent stools are non-bloody with mucus and foul smell. The child has no fever, but does complain of "tummy hurting." The increase of fat in the stool directs the peditrician's concern toward a diagnosis of malabsorption syndrome associated with which of the following?**
- a) Amebiasis
 - b) Scariasis
 - c) Balantidiasis
 - d) Enterobiasis
 - e) **Giardiasis**

10. A 25 year old male who is a soldier in US army, returning from a tour of Middle East, has fever and weight loss for past 3 weeks. Laboratory tests revealed Anemia and leukopenia. Blood cultures for bacteria and fungi were negative. HIV test were also negative. CT scan revealed Splenomegaly. A bone marrow biopsy revealed amastigotes within mono nuclear cells. Which of the following is the cause?

- a) **Leishmania donovani**
- b) Plasmodium falciparum
- c) Toxoplasma
- d) Trypanosoma
- e) Cryptosporidium

11. Which of the following organism is not a protozoon?

- a) Entamoeba histolytica
- b) **Enterobius vermicularis**
- c) Plasmodium
- d) Leishmania
- e) Trichomonas

12. A mother states that she has observed her 4-year-old son scratching his anal area frequently. The most likely cause of this condition is

- a) Trichomonas vaginalis
- b) **Enterobius vermicularis**
- c) Ascaris lumbricoides
- d) Necator americanus
- e) Entamoeba histolytica

13. You are working in a rural medical clinic in China and a 3-yearold girl is brought in by her mother. The child appears emaciated and, upon testing, is found to have a hemoglobin level of 5 g/dL. Her feet and ankles are swollen, and there is an extensive rash on her feet, ankles, and knees. The most likely parasitic infection that causes the child's condition is

- a) Schistosomiasis
- b) Cercarial dermatitis
- c) Cyclosporiasis
- d) **Hookworm infection**
- e) Trichuriasis

14. Pathologic effects of filariae in humans are caused by which of the following organism?

- a) Brugia malayi
- b) Mansonella ozzardi
- c) Ascaris
- d) **Wuchereria bancrofti**

e) Trichomonas

15. Several Papua New Guinea villagers known to eat pork during celebrations were reported to be suffering from an outbreak of epileptiform seizures. One of first things you should investigate is

- a) The prevalence of Ascaris infections in the population
- b) The prevalence of schistosomiasis in the population
- c) The presence of Trypanosoma brucei gambiense in the-villagers
- d) The presence of Giardia cysts in the drinking water
- e) **The presence of Taenia solium in the pigs**

16. A 32-year-old male tourist traveled to Senegal for 1 month. During the trip, he swam in the Gambia river. Two months after his return, he began complaining of intermittent lower abdominal pain with dysuria. Laboratory results of ova and parasites revealed eggs with a terminal spine. Which of the following parasites is the cause of the patient's symptoms?

- a) Toxoplasma gondii
- b) Schistosoma mansoni
- c) **Schistosoma haematobium**
- d) Ascaris lumbricoides
- e) Taenia solium

17. What type of specimen should be collected for laboratory analysis of patient with schistosoma hematobium infection?

- a) Thick blood smear
- b) Stool sample
- c) **Urine sample**
- d) Blood for serology
- e) Sputum sample

18. A 37-year-old sheep farmer from Australia presents with upper right quadrant pain, fever and appears slightly jaundiced. A stool exam was negative for ova and parasites but a CT scan of the liver reveals a large 14-cm cyst that appears to contain fluid. Which of the following parasites should be considered?

- a) Toxoplasma gondii
- b) Taenia solium
- c) Taenia saginata
- d) Schistosoma mansoni
- e) **Echinococcus granulosus**

19. A young boy had history of ingesting under cooked fish from a new restaurant and he developed megaloblastic Apemia afterwards. Which of the following is the causative agent?

- a) **Diphyllobothrium latum**
- b) Ascaris lumbricoides

- c) Ankylostoma duodenale
- d) Enterobius vermicularis
- e) Taenia solium

20. A medical technologist visited Scandinavia and consumed raw fish daily for 2 weeks. Six months after her visit, she had a routine physical and laboratory examination, and was found to be anemic. Her vitamin B12 levels were below normal. The most likely cause of her vitamin B12 deficiency anemia is

- a) Excessive consumption of ice-cold vodka
- b) Infection with yersinia
- c) Infection with parvovirus B19
- d) Infection with the fish tapeworm Diphylobothrium latum**
- e) Cystecercosis

21. A child 5 years of age presented in emergency with diarrhea. On examination the patient is suffering from rectal prolapsed. The patient would be suffering from heavy infestation of

- a) Hookworm
- b) Pinworm
- c) Thread worm
- d) Round worm
- e) Whipworm**

22. A 40 years old male presented to you in outdoor with presenting complaints of swelling of right leg, non-pitting edema and swelling of the genitalia as well. The patient is suffering from

- a) Congestive cardiac failure
- b) Filariasis**
- c) Renal insufficiency
- d) Venous thrombosis
- e) Gonococcal orchitis

23. Which of the following is definitive host for Echinococcus granulosus?

- a) Dog**
- b) Sheep
- c) Cattle
- d) Man
- e) Goat

24. A 40 year old woman has just had a grand mal seizure. There is a history of headaches for the past week and one episode of veaigo and no previous seizures. She is afebrile MRI reveals a mass in the parietal lobe. Surgical removal of the mass reveals a larva within a cyst like sac. What is the most likely diagnosis?

- a) **Taenia solium**
- b) Taenia saginata
- c) Toxoplasma gondii
- d) Entamoeba histolytica
- e) Echinococcus granulosus

25. Analysis of a patent's stool reveals small structures resembling sand grains; microscopic examination shows these to be proglottids. The most likely organism in this patient's stool is:

- a) Enterobius vermicularis
- b) Ascaris lumbricoides
- c) Necator americanus
- d) **Taenia saginata**
- e) Trichuris trichiura

26. Farmer spreads manure in his fields while he was bare footed. Later on he developed acute pruritis with some vesicles on his feet. He visited the physician after a week when he had abdominal discomfort and loss of appetite. Peripheral blood examination reveals microcytic hypochromic anemia and eosinophilia. Which of the following is th_g,most likely cause?

- a) **Anchylostoma duodenale**
- b) Poor nutrition
- c) Plasmodium falciparum
- d) Pinworm
- e) Insect bite

MYCOLOGY

1. Patient receiving corticosteroid treatment for lupus developed headache and fever and when she began to display some memory loss she was brought to her physician by her spouse. Considered in the differential diagnosis was cryptococcal meningitis. Which of the following, if found upon examination of cerebrospinal fluid would support that diagnosis ?
 - a) **Encapsulated yeast cells**
 - b) Hyphae
 - c) Intracellular yeast cells
 - d) Yeast cells with multiple buds
 - e) Yeast cells with a broad base between mother and daughter cells
2. A 57 year old obese, white female with type 1 diabetes mellitus is diagnosed with streptococcal throat infection and prescribed penicillin. A week later she returns complaining of a sore mouth and white patches on the tongue. Your examination confirms the white pseudomembranous lesions . Material from the lesion is obtained and prepared for microscopic examination. Your suspicion of the most likely clinical diagnosis will be confirmed by observation of buccal epithelial cells , leukocytes , and which of the following
 - a. Gram-positive bacteria
 - b. Gram-negative bacteria
 - c. Hyphae with septa and acute angle branching
 - d. Spherules containing endospores
 - e. **Yeast cells , hyphae, and pseudohyphae**
3. A normally healthy young man in Arizona was diagnosed with coccidioidomycosis. The most likely route of infection for the etiologic agent is
 - a. Aspiration
 - b. Cutaneous contact
 - c. Ingestion
 - d. **Inhalation**
 - e. Implantation
4. *Candida albicans* is isolated in blood culture from a patient in a surgical intensive care unit. This most likely source of the infecting organism is
 - a. A health care worker
 - b. A visitor
 - c. Ambient air
 - d. **The patient**
 - e. The surgeon

5. A 45 year old diabetic female is diagnosed with vulvovaginitis. When a smear is made, an oval shaped structure with a single bud is seen. Which of the following is the most likely organism?
- Coccidioides immitis*
 - Malassezia furfur*
 - Aspergillus fumigates*
 - Pneumocystis carinii*
 - Candida albicans***
6. An athlete complains of discoloration and thickening of skin on his foot. The lesions are red, circular, with a vesiculated border and a central healing area. The most appropriate laboratory procedure would be:
- Potassium hydroxide mount of skin scrapings**
 - Giemsa stain for multinucleated giant cells
 - Fluorescent antibody stain of vesicle fluid
 - Four fold rise in antibody titer against the organism
 - Gram stain of skin smear
7. Which statement regarding fungi is correct?
- All fungi are able to grow as yeasts and molds
 - Pseudohyphae are produced by all yeasts
 - Molds produce hyphae that may or may not be partitioned with cross walls or septa**
 - The cell wall is not essential for fungal viability and survival
 - Fungi are prokaryotic organisms
8. Which of the following media is used to culture fungi?
- MacConkey medium
 - Sabouraud`s dextrose agar**
 - Chocolate agar
 - Eosin-methylene blue agar
 - Lowenstein Jensen`s medium
9. A 30 year old female presented with history of vaginal discharge and itching. A previous history of antibiotic use is present. Diagnosis of candidiasis is made initially. Which of the following organism of normal flora would have been suppressed causing this type of infection?
- Staphylococcus aureus*
 - Pseudomonas aeruginosa*
 - Hemophilus species*
 - Clostridium species*
 - Lactobacillus species***

VIROLOGY

- 1. 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.
- 2. 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. Coxsackie virus
 - d. Molluscum contagiosum
 - e. Ebsteinbar virus
- 3. Which of the following conditions is least likely to be caused by adenoviruses?**
 - a. Conjunctivitis
 - b. Pneumonia
 - c. Pharyngitis
 - d. Glomerulonephritis**
- 4. Which of following viruses causes a mononucleosis-like syndrome & excreted in urine?**
 - a. Cytomegalovirus**
 - b. Epstein-Barr virus
 - c. Human herpesvirus 6
 - d. Varicella-zoster virus
 - e. Herpes simplex virus type 2
- 5. 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
- 6. 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
7. **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.
8. **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
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. **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
11. **4. A 42-year-old man with HIV/AIDS presented with aplastic anemia. Using the PCR, 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
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 statements reflects the pathogenesis of influenza?**
- a) The virus enters the host in airborne droplets.**
 - b) Viremia is common.
 - c) The virus frequently establishes persistent infections in the lung.
 - d) Pneumonia is not associated with secondary bacterial infections.
 - e) Viral infection does not kill cells in the respiratory tract.
15. **Which of the following statements concerning antigenic drift in influenza viruses is correct?**
- a) It results in major antigenic changes.
 - b) It is exhibited only by influenza A viruses.
 - c) It is caused by frameshift mutations in viral genes.
 - d) It results in new subtypes over time.**
 - e) It affects predominantly the matrix protein.
16. **A 32-year-old male physician developed a "flulike" syndrome with fever, sore throat, headache, and myalgia. To provide laboratory confirmation of influenza, a culture for the virus was ordered. Which of the following would be the best specimen for isolating the virus responsible for this infection?**
- a) Stool
 - b) Nasopharyngeal swab**
 - c) Vesicle fluid
 - d) Blood
 - e) Saliva.

17. Which of the following infectious agents is most likely to cause a pandemic?
- Influenza A virus**
 - Streptococcus pyogenes
 - Influenza B virus
 - Respiratory syncytial virus
 - Influenza C virus
18. **4-year-old boy develops an acute febrile illness. His pediatrician diagnoses mumps. The organ most commonly exhibiting signs of mumps is the**
- Lungs
 - Ovary
 - Parotid glands**
 - Skin
 - Testes.
19. **A 27-year-old woman who is 2 months' pregnant develops fever, malaise, and arthralgia. A fine maculopapular rash appears on her face, trunk, and extremities. Rubella is diagnosed, and there is concern that the fetus will be infected, resulting in the congenital rubella syndrome. Which of the following statements about this syndrome is correct?**
- The disease can be prevented by vaccination of school-age children with measles vaccine.
 - Congenital abnormalities occur when a nonimmune pregnant woman is infected at any time during pregnancy.
 - Deafness is a common defect associated with congenital rubella syndrome.**
 - Only rare strains of rubella virus are teratogenic.
 - None of the above
20. **A 20-month-old boy had an illness characterized by fever, irritability, conjunctivitis, and a brick-red rash initially on the face but spreading downward and outward. At age 9 years, the boy had a gradual onset of severe, generalized neurologic deterioration. Subacute sclerosing panencephalitis (SSPE) was diagnosed. Which of the following statements about SSPE is correct?**
- Defective varicella-zoster virus is present in brain cells.
 - High titers of measles antibody are found in cerebrospinal fluid.**
 - The incidence of the disease is rising since the introduction of MMR vaccine.
 - Rapidly progressive deterioration of brain function occurs.
 - The disease is a rare, late complication of rubella infection.
21. **Which of the following statements is more likely to be true of measles (rubeola) than German measles (rubella)?**
- Koplik spots are present.**
 - It causes birth defects.
 - It causes only a mild illness.
 - Human beings are the only natural host.
 - Attenuated virus vaccine is available for prevention.

22. **Rabies virus is rapidly destroyed by**
- a) Ultraviolet radiation
 - b) Heating at 56°C for 1 hour
 - c) Ether treatment
 - d) Trypsin treatment
 - e) **All of the above**
23. **The presence in neurons of eosinophilic cytoplasmic inclusion bodies, called Negri bodies, is characteristic of which of the following central nervous system infections?**
- a) Barna disease
 - b) **Rabies**
 - c) Subacute sclerosing panencephalitis
 - d) New variant Creutzfeldt-Jakob disease
 - e) Postvaccinal encephalitis.
24. **Which of the following statements about rabies vaccines for human use is true?**
- a) Contain live, attenuated rabies virus
 - b) Contain multiple antigenic types of rabies virus
 - c) Can treat clinical cases of rabies
 - d) **Can be used for post exposure prophylaxis**
 - e) They are associated with Guillain-Barre syndrome
25. **The typical course of an untreated HIV infection extends over 10 or more years. There is usually a long period (clinical latency) between the time of primary HIV infection and the development of AIDS. During this period of clinical latency.**
- a) HIV is not detectable in the plasma
 - b) CD4 cell counts remain unchanged
 - c) Virus replicates at a very low rate
 - d) **Virus is present in lymphoid organs**
 - e) Neutralizing antibodies are not elicited
26. **What are the most common symptoms of acute HIV infection?**
- a) Rash and sore throat
 - b) **Fever and malaise**
 - c) Diarrhea
 - d) Jaundice and hepatitis
 - e) Neuropsychiatric and behavioral changes
27. **In a person with HIV infection, potentially infectious fluids include all of the following except**
- a) Blood
 - b) Saliva visibly contaminated with blood
 - c) **Urine not visibly contaminated with blood**
 - d) Genital secretions
 - e) Amniotic fluid.

28. **Which of the following statements about dengue virus is not true?**
- a) It is the most important mosquito-borne viral disease affecting humans.
 - b) It is distributed worldwide in tropical regions.
 - c) It can cause a severe hemorrhagic fever.
 - d) There is a single antigenic type.**
 - e) One form of disease is characterized by increased vascular permeability.
29. **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
30. **HDV (delta agent) is found only in patients who have either acute or chronic infection with HBV. Which of 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.
31. **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.**
32. **Several different viruses can cause hepatitis. One of the following statements applies to all four viruses: HAV, HCV, HDV, and HEV.**
- a) It contains a single-stranded RNA genome.**
 - b) It is transmitted primarily by the parenteral route.
 - c) It is transmitted primarily by the fecal—oral route.
 - d) It is associated with fulminant hepatitis.
 - e) It undergoes sequence variation during chronic infection

33. **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.
34. **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