

## MIDTERM EXAMINATION

Select the best answer for the multiple choice questions. There are 92 questions and 12 pages on the examination. Notify the instructor if your examination does not have 12 pages. Enter your name and identification number on the scantron and fill out the columns for the letters of your name and numbers of your identification number correctly. Clearly indicate on the scantron the one best answer to each question among the answers provided. Be sure that you have selected your choice correctly. If you change an answer, be sure to erase thoroughly. Use a #2 pencil and fill all circles completely.

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1. Epidemiologists define disease occurrence in terms of:
  - a. Agent
  - b. Host
  - c. Environment
  - d. All of the above**
  - e. a. and b. above
  
2. Which of the following factors play a key role in likelihood of infectious disease acquisition?
  - a. Genetic profile
  - b. Human behavior
  - c. Environmental conditions
  - d. All of the above**
  - e. a. and b. above
  
3. The portal of entry and exit for most infectious diseases, including HIV, is the same:
  - a. True
  - b. False**
  
4. Influenza is an example of a(n):
  - a. Agent that mutates frequently
  - b. Is a zoonotic disease
  - c. Resurgence of an endemic disease
  - d. All of the above
  - e. a. and b. above**
  
5. Tuberculosis and gonorrhea are examples of:
  - a. Sexually transmitted diseases
  - b. Being caused by agents that have not yet become drug-resistant
  - c. Are currently major health problems globally
  - d. All of the above
  - e. b. and c. above**
  
6. MERS-coV is an example of:
  - a. A newly discovered agent**
  - b. An agent that has caused a global pandemic
  - c. Has spread rapidly throughout the Middle East and the United States
  - d. All of the above
  - e. b. and c. above

7. Virulence is the:
- Ability to cause clinical disease
  - Ability to cause severe disease**
  - The ability to evoke an immune response
  - All of the above
  - a. and b. above
8. An infectious disease agent may cause:
- No infection
  - Subclinical infection
  - Clinical infection
  - All of the above**
  - b. and c. above
9. Septicemia is:
- Acute illness caused by agents circulating in the blood**
  - Infection in a previously healthy person
  - Caused by secondary infection
  - An example of the carrier state
  - b. and d. above
10. The incubation period is the interval between:
- The time of infection and death
  - Appearance of clinical symptoms and death
  - The time of infection and appearance of clinical symptoms**
  - Time of infection and appearance of antibodies
  - Time of infection and the appearance of IgM agent specific immunoglobulins
11. A "fomite" is:
- An agent conducting aerosol
  - A blanket, door handle or other inanimate article on the surface of which the agent resides**
  - A vector between an arthropod and the susceptible host
  - An agent bearing substance that is eaten or drunk
  - b. and d. above
12. Bacteria differ from other disease agents because they have a cell wall:
- True**
  - False
13. A gram-positive organism:
- Is a bacteria
  - Retains crystal violet dye
  - Includes vibrio cholera
  - All of the above
  - a. and d. above**

14. An epitope is:
- An antigen
  - A subunit of an antigen that binds with specific immune receptors**
  - Usually causes autoimmune disease
  - The envelope of a virus
  - A component of bacterial cell walls
15. Immune activation of immune cells:
- Is stimulated by binding of an antigen to a receptor
  - Stimulates cell proliferation
  - Causes release of regulatory and effector cells
  - All of the above**
  - a. and b. above
16. Which component of the humoral immune system responds first to an antigen?
- IgA
  - IgE
  - IgG
  - IgM**
17. Activation of a T cell requires:
- A foreign antigen
  - An antigen-presenting cell
  - An initial humoral immune response
  - All of the above
  - a. and b. above**
18. The main cell types of the innate immune system are:
- T cells
  - Macrophages
  - Dendritic cells
  - NK cells
  - b., c. and d. above**
19. Natural killer cells do not need to be induced or primed to kill agent-bearing cells:
- True**
  - False
20. The major role of the immune system is to distinguish self from non-self:
- True**
  - False
21. The important characteristics of the immune system include:
- Ability to distinguish self from non-self
  - Memory of previously encountered antigens
  - Specificity to a single antigen or epitope
  - All of the above**
  - a. and b. above

22. B cells require presentation of an epitope by an antigen-presenting cell in order to be stimulated to produce antibodies:
- a. True
  - b. False**
23. MHC molecules present epitopes to:
- a. CD 4 cells
  - b. CD8 cells
  - c. B cells
  - d. NK cells
  - e. a. and b. above**
24. Natural killer cells:
- a. Do not have antigen receptors
  - b. Can reduce the intensity of the immune response
  - c. Initiate a non-specific response to a foreign agent
  - d. All of the above**
  - e. b. and c. above
25. Cytokines:
- a. Are secreted by immune cells
  - b. Initiate both stimulatory and regulatory actions
  - c. Attach to receptors on the target cell
  - d. All of the above**
  - e. b. and c. above
26. Cytotoxic cells:
- a. Express CD8 on their surface
  - b. Inhibit or kill other cells
  - c. Regulate B cell activation
  - d. All of the above
  - e. a. and b. above**
27. All laboratory tests must have a control to indicate that the test is functioning properly:
- a. True**
  - b. False
28. Preparation of the donor and transport of the specimen are essential for accurate laboratory testing:
- a. True**
  - b. False
29. Proper specimen collection requires:
- a. Collection in the correct collection tube or device
  - b. Mixing the specimen with the additive in the tube immediately after collection
  - c. Maintaining a proper temperature of the specimen
  - d. All of the above**
  - e. a. and b. above

30. Laboratory managers are particularly concerned about:
- Random error
  - Systematic error**
31. Which occurs first after infection with HIV?
- Positive viral load test**
  - Positive antibody test
  - Positive Western blot test
  - Development of antigen-specific IgG
32. Which receptors are required for attachment of the HIV virion on to the target cell?
- CD4, CCR5**
  - CD4, CD8
  - CD4, CD28
  - CD8, CCR5
  - CD8, CD28
33. Which components of the HIV virion attach to the CD4 target cell initially?
- gp120, p24
  - gp120, gp41**
  - p24, p17
  - p51, gp41
  - p51, p17
34. The genetic material of the HIV virion (not the provirus) is:
- DNA
  - RNA**
  - Both DNA and RNA
35. HIV is one of the most easily transmitted infectious diseases:
- True
  - False**
36. Proliferation of immune cells is suppressed in the early phases of HIV infection:
- True
  - False**
37. The plasma level of HIV virions in the infected host is highest:
- Within one week of infection**
  - Between the first<sup>t</sup> and second year after infection
  - During the asymptomatic phase of infection
  - At the time of the onset of symptoms
  - Just before death
38. HIV-infected individuals who do not have progressive loss of CD4 cells:
- Maintain an equilibrium between cell proliferation and viral replication
  - Are often heterozygous for the gene coding the CCR5 receptor
  - Are infected with a benign strain of HIV
  - All of the above
  - a. and b. above**

39. Successful treatment of HIV results in partial restoration of the host immune response:  
a. **True**  
b. False
40. The biggest single barrier to prevention of HIV/AIDS is:  
a. The cost of treatment  
b. Reluctance of some individuals to be treated  
c. **The high proportion of individuals globally who do not know that they are infected**  
d. The lack of a cure for HIV  
e. The concentration of the epidemic in sub-Saharan Africa
41. Effective prevention strategies to reduce HIV transmission include:  
a. Condoms  
b. Successful treatment of HIV-infected individuals  
c. Incarceration of sexually promiscuous individuals  
d. All of the above  
e. **a. and b. above.**
42. An effective surveillance system includes:  
a. Ongoing collection of data  
b. Timely analysis  
c. Rapid dissemination of results  
d. **All of the above**  
e. a. and c. above
43. The Centers for Disease Control Morbidity and Mortality Weekly Report is based on:  
a. Active surveillance  
b. **Passive surveillance**  
c. Both active and passive surveillance
44. The primary objective of screening is to establish trends in the occurrence of specific diseases:  
a. True  
b. **False**
45. The accuracy of the diagnosis is the primary concern for an effective surveillance system:  
a. True  
b. **False**
46. Successful surveillance is facilitated by:  
a. Keeping the questionnaire short and simple  
b. Seeking the assistance of groups supportive of the target population  
c. Not using invasive strategies for specimen collection  
d. **All of the above**  
e. a. and c. above

47. Surveillance systems usually use which of the following study designs?
- Cohort
  - Cross-sectional
  - Serial cross-sectional**
  - Case-control
  - Mortality
48. Behavioral surveillance requires more frequent surveys than surveys to document disease spread:
- True
  - False**
49. Which three parameters does the Reed-Frost Model use?
- Time, place and person
  - Agent, host and environment
  - Susceptibles, infected, and immunes**
  - Susceptibles, infected and sick
  - Resistant, infect and immune
50. An epidemic will die out when the reproductive number is:
- 1
  - >1
  - >2
  - < 1**
  - <2
51. A reduction in which of the following factors will reduce the rate of spread of an epidemic?
- Transmission probability per contact
  - Contact rate
  - Duration of infectiousness
  - All of the above**
  - a. and c. above
52. As an epidemic spreads in a closed population, the number of susceptibles will:
- Increase
  - Decrease**
  - Stabilize
53. The higher the reproductive number the more effective the intervention must be to reduce the spread of the agent:
- True**
  - False
54. The persistence of an epidemic depends on:
- Births
  - In migration
  - The conversion of susceptible to immunes
  - All of the above
  - a. and b. above**

55. Modeling can contribute to determining the sample size by:
- Providing an estimate of the effect size**
  - Predicting the number of immunes
  - Predicting the number of susceptibles
  - All of the above
  - b. and c. above
56. In the Southern African modeling study to predict the number of infections among MSM averted in the next five years, the factor that made the greatest contribution was:
- A 50% increase in ART coverage
  - 50% acceptance of PREP by high-risk individuals
  - A 50% reduction in the number of persons practicing anal intercourse**
  - A 5% increase in HIV testing
57. One-third of the world's population has:
- A positive PPD**
  - Active tuberculosis
  - Susceptibility to tuberculosis
  - Miliary tuberculosis
58. The TB rate in California is lower than for the U.S. as a whole, reflecting the healthier lifestyle of Californians:
- True
  - False**
59. The leading cause of malnutrition in children younger than 5 years is:
- Dehydration
  - Chronic diarrhea**
  - Chronic lower respiratory infections
  - Late weaning
  - Maternal HIV
60. Tuberculosis in the United States occurs primarily among:
- The homeless
  - Foreign migrants
  - Newborns
  - All of the above
  - a. and b. above**
61. The highest proportion of TB cases in the United States occurs in:
- Asian-Americans
  - African-Americans**
  - Hispanic-Americans
  - European-Americans
62. TB-infected children are not infectious:
- True**
  - False



63. The majority of TB is transmitted:
- By respiratory droplet**
  - Transplacentally
  - Direct skin-to-skin contact
  - By Aedes Aegypti mosquitoes
  - By blood
64. LTBI is defined by:
- A positive PPD, a negative x-ray, and no symptoms**
  - A positive x-ray, a positive PPD, and no symptoms
  - Physical symptoms, a negative X-ray, and a positive PPD
  - A positive PPD, positive x-ray, and symptoms
65. A TB patient is considered non-infectious when he/she has:
- A negative chest x-ray
  - Three sequential negative sputum smears**
  - No physical symptoms
  - All of the above
  - a. and b. above
66. If it occurs, TB meningitis usually occurs:
- Early in the course of infection**
  - Late in the course of infection
  - Equally during all phases of infection
67. A recently developed test that has both a high sensitivity and a high specificity is:
- Gold QuantiFERON**
  - PPD
  - Sputum
  - Serology
68. Culture of sputum is still the best test for determining susceptibility of the TB strain to specific drugs:
- True**
  - False
69. Which of the following drugs is NOT bactericidal?
- RIF
  - PZA
  - STP
  - ETH**
70. All children with a positive PPD but no evidence of clinical tuberculosis should be treated with INH or an alternative drug for nine months:
- True**
  - False
71. In the developing world, DOT is recommended for treatment of TB:
- True**
  - False

72. The lower respiratory tract includes:
- Pharynx, esophagus and alveoli
  - Trachea, bronchi and alveoli**
  - Nasal cavity, pharynx and sinuses
  - Alveoli, pharynx and trachea
  - Trachea, pharynx and bronchi
73. The pathogen most commonly involved in community-acquired pneumonia is:
- Gram-negative bacilli**
  - Staphylococcus aureus
  - Fungi
  - Legionella
74. Individuals with low birth weight are more susceptible to acute respiratory infections:
- True**
  - False
75. Acute respiratory infections are most frequent in which of the following age groups?
- <2 years**
  - 3-5 years
  - 6-18 years
  - 18-45 years
  - >65 years
76. Lower respiratory infections are the \_\_\_\_\_ most common cause of death in low-income countries:
- First**
  - Second
  - Third
  - Fourth
  - 15th
77. Diarrheal diseases are the \_\_\_\_\_ most common cause of death in low-income countries:
- First
  - Second**
  - Third
  - Fourth
  - 15<sup>th</sup>
78. The proportion of the global supply of water that is available for drinking, irrigation, and industrial purposes is:
- <1%**
  - 5%
  - 10%
  - 50%
  - 78%

79. The United States has led the movement to make easy access to water a “basic human right”:
- True
  - False**
80. The highest number of DALYs attributable to lack of adequate safe water, sanitation and hygiene is in:
- North American
  - Sub-Saharan Africa**
  - China
  - South Asia
  - Los Angeles
81. The second most frequent infectious disease in the United States is:
- Influenza
  - Gonorrhea**
  - Syphilis
  - Diarrhea
  - HIV
82. The most common cause of diarrhea globally is:
- E. coli
  - Compylobacter
  - Rotavirus**
  - V. cholerae
  - Cyclospora cayetanensis
83. Treatment of acute diarrhea includes:
- Oral rehydration and penicillin
  - Oral rehydration, zinc supplementation**
  - Intravenous saline and penicillin
  - Oral rehydration, energy-rich food, and zinc supplementation
  - Energy-rich food and zinc supplementation
84. The animal linked to Ebola virus is the:
- Bat**
  - Rabbit
  - Ferret
  - Guinea pig
  - Pigs
85. A category A emerging infectious disease must:
- Be easily disseminated
  - Potentially cause public panic and social disruption
  - Result in moderate morbidity and low mortality
  - All of the above
  - a. and b. above**

86. The relative risk of the emergence of new pathogens is high in:
- China
  - North India
  - Los Angeles
  - All of the above**
  - b and c. above
87. Prior to 1960, dengue occurred primarily in:
- Southeast Asia
  - Northern South America
  - Sub-Saharan Africa
  - All of the above
  - a. and b. above**
88. Dengue hemorrhagic disease occurs only in children:
- True
  - False**
89. Treatment of dengue includes:
- Penicillin, and platelet replacement
  - Supportive care and platelet replacement**
  - Supportive care, aspirin and platelet replacement
  - Penicillin, supportive care and platelet replacement
  - Acetaminophen, penicillin and supportive care
90. Prevention of dengue epidemics includes:
- Surveillance for and elimination of standing water
  - Control of *Aedes Albopictus* and *A. aegypti*
  - Immunization
  - All of the above
  - a. and b. above**
91. Sudden acute respiratory syndrome continues to be a major problem in:
- China
  - Southeast Asia
  - Sub-Saharan Africa
  - All of the above
  - None of the above**
92. H5N1 is:
- Highly lethal for poultry
  - Highly lethal for humans
  - Of major economic concern
  - All of above**
  - a. and c. above