EPIDEMIOLOGY MIDTERM / FALL 2000

INSTRUCTIONS: Write your name in the usual location. This exam is a closed-book exam, with the exception of the formula sheet. The time limit is 60 minutes. Use the backs of pages for addition work space, when necessary. Each question is worth 1 point, unless otherwise specified.

1. A person free of disease who shows a positive test result is a (circle best response): (A) true positive (B) true negative (C) false positive (D) false negative

ANS: (C)

2. A person who has the disease who shows a negative test result is a: (A) true positive, (B) true negative, (C) false positive, (D) false negative.

ANS: (D)

3. The sensitivity of a test tells you: (A) the percentage of people with disease that will test positive, (B) the percentage of people with disease that will test negative, (C) the percentage of people without disease that will test negative, (D) the percentage of people without disease that will test negative.

ANS: (A)

4. The specificity of a test tells you: (A) the percentage of people with disease that will test positive, (B) the percentage of people with disease that will test negative, (C) the percentage of people without disease that will test negative, (D) the percentage of people without disease that will test negative.

ANS: (D)

5. In protecting the blood supply from HIV, your most important priority is to avoid: (A) false positives, (B) false negatives, (C) true negatives, (D) true positives

ANS: (B)

6. Increasing the cutoff point for a screening test will often increase its specificity. What will it do to its sensitivity? (A) It will increase the sensitivity. (B) It will decrease the sensitivity. (C) It will have no effect on the sensitivity.

ANS: (B)

7. An examiner finds a weeping canker sore on a patient. Is this an example of a sign, symptom, or test? (A) Sign (B) Symptom (C) Test

ANS: (A)

8. A test that is 90% sensitive is used in 200 people with disease and 1000 people without disease. How many true positives and false negatives will it identify? Show work. [2 pts]

ANS: It will identify (.9)(200) = 180 true positives. The remaining 20 cases will be false negatives.

9. A test in which SEN = 0.92 and SPEC = 0.96 is used in population of 5,000 individuals. The prevalence of disease is 0.025. Determine the number of TPs, TNs, FPs, and FNs, and put this information in the table below. Show all work. [8 pts]

	D+	**D-**	
T+	_____	_____	_____
T-	_____	_____	_____
	_____	_____	5000

ANS:
$m_1 = (.025)(5000) = 125$
$m_2 = 5000 - 125 = 4875$
TP = (.92)(125) = 115
FN = 125 - 115 = 10
TN = (.96)(4875) = 4680
FP = 4875 - 4680 = 195
$n_1 = 115 + 195 = 310$
$n_2 = 10 + 4680 = 4690$

10. Calculate the PVP for the above test.
ANS: PVP = 115 / 310 = .371

11. Calculate the PVN for the above test.
ANS: PVN = 4680 / 4690 = .998

12. Can a positive test be trusted? Explain. [2 pts]
ANS: No. The predictive value positive indicates that only 37% of the positive tests will be true positives.

13. Can a negative test be trusted? Explain. [2 pts]
ANS: Yes. The predictive value negative indicates that only nearly 100% of the negative tests will be true negatives.

14. The normal habitat in which an agent lives and multiplies is called its (circle best response): (A) portal (B) carrier (C) reservoir (D) zoonosis.

ANS: (C)

15. What is a zoonosis?

ANS: A zoonosis is a disease with an animal reservoir; it is a disease shared by humans and another animal species.

16. Parasitic worms are also called: (A) helminths (B) protozoans (C) rickettsia (D) prions

ANS: (A)

17. List two different portals for HIV: [2 pts]

    a. _____

    b. _____

ANS: Main portals: skin, urogenital, placenta. Less commonly: gastrointestinal, mammary (as discussed in class).

18. Circle best response: Innate immunity is to immunity you are born with. It includes (A) physical barriers (e.g., skin) (B) chemical barriers (e.g., acidity of the stomach) (C) cellular barriers (e.g., macrophages) (D) all of the above.

ANS: (D)

19. Other than the skin, list a physical barrier to infection.

ANS: mucosal linings, mucus sheaths, respiratory cilia, cough reflect, gag reflex, other reflexes

20. Circle the best response: Acquired immunity is immunity you develop after being born. It includes (A) a humoral component (e.g., antibodies), (B) a cellular component (e.g., lymphocytes), (C) both "A" and "B" (D) neither "A" nor "B"

ANS: (C)

21. Which of the following results in a type of *passive* acquired immunity? (A) vaccination (B) natural exposure (C) use of toxoid (D) use of an immunoserum or antivenom.

ANS: (D)

22. Harmless derivatives of microbiologic toxins that simulate an active immune response to toxins released by pathogens and other poisonous sources are called: (A) vaccinations (B) toxoids (C) immunoserums (D) chemical barriers

ANS: (B)

23. Match the definitions below with one of the following terms: sporadic, endemic, point epidemics, propagating epidemic

propagating epidemic	occurring in clear excess with continuing increases over time
sporadic	occurring rarely, without regularity
point epidemic	occurring in clear excess and rapidly returning to normal
endemic	occurring at a more-or-less consistent level

24. How can you have an infection without having an infectious disease?
ANS: By being an asymptomatic carrier.

25. Which of the following factors could contribute to an epidemic? (A) Decreases in host resistance (B) Increased pathogenicity of the agent (C) Changes in environmental factors that favor the agent (D) all of the above
ANS: (D)
26. Which model of disease occurrence does this statement describe? "Direct and indirect causes of a disease form a complex network of inter-related events in which direct causes and indirect causes contribute to disease occurrence." Select the best response: (A) causal web model (B) risk factor / risk indicator model (C) necessary, sufficient, and contributing model.
ANS: (A)
27. Secondary prevention occurs during the Stage of (A) Susceptibility (B) Subclinical disease (C) Clinical disease (D) Recovery, disability, or death.
ANS: (B)
28. The pump that transmitted cholera during the 1854 epidemic was on what street? (A) San Carlos (B) Main Street (C) Broad Street (D) 42nd Street
ANS: (C)
29. In addition to being an amateur epidemiologist, John Snow was also a (A) health educator (B) surgeon (C) anaesthesiologist (D) pharmacist
ANS: (C)
30. The reason the Southwark and Vauxall company's water was more likely to cause cholera than the other water companies of 19th century London was because it was: (A) colder (B) less expensive (C) smellier (D) more likely to be contaminated with fecal matter.
ANS: (D)
31. The WHO definition of health includes all of the following *except*: (A) physical well-being (B) emotional well-being (C) social well-being (D) spiritual well-being
ANS: (D)
32. Which occurred first? (A) Pasteur's isolation of pathogenic bacterial (B) Koch's postulates for causality (C) Snow's discovery of the water-borne transmission of cholera
ANS: (C)
33. Which of the following statements is true? (A) Cardiovascular disease is still the most common cause of death in the US (B) Cancer rates are increasing dramatically (C) AIDS is one of the top five causes of death (D) Stroke rates are increasing.
ANS: (A)
34. Who has the greater life expectancy? (A) Females (B) Males
ANS: (A)
35. Who has the greater life expectancy? (A) Blacks (B) Whites
ANS: (B)
36. Who as the greater life expectancy? (A) Black females (B) White males
ANS: (A)
37. Fill in the blanks: In 1900, the most common causes of death were acute and contagious. Today, most are _____ and _____. [2 pts]
ANS: chronic and non-contagious
38. The book review I handed out in class started with: "A team of scientists recently announced that it had sequenced the entire genome of the bacteria that causes cholera. News reports alleged that this triumph of high-tech science would open the door to new vaccines and drugs t fight the disease. ¶ When I heard the news, I wondered what John Snow would have thought." What do you think John Snow would have thought? (Please answer on the back of the prior page.)