銘傳大學 96 學年度研究所碩士班招生考試
生物科技學系碩士班
第二節

微生物學試題

（第 1 頁共 3 頁）
（限用答案本作答）

I. Choice (20%)

1. *Spirillum* is not classified as a spirochete because spirochetes
   a. do not cause disease.
   b. possess axial filaments.
   c. possess flagella.
   d. are prokaryotes.
   e. none of the above.
2. A viroid is
   a. A complete, infectious virus particle
   b. A naked, infectious piece of RNA
   c. A capsid without a nucleic acid
   d. A provirus
   e. None of the above
3. The envelop of an animal virus is derived from the ____ of its host cell.
   a. cell wall
   b. glycocalyx
   c. cell membrane
   d. receptors
4. Which of the following dose not provide protection from phagocytic digestion?
   a. Preventing formation of phagolysosomes
   b. Killing white blood cells
   c. Lysing phagolysosomes
   d. Ability of grow at a low pH
   e. None of the above
5. Which of the following is involved in specific resistance (immunity)?
   a. Basophil
   b. Eosinophil
   c. Lymphocyte
   d. Monocyte
   e. Neutrophil
6. Newborns' immunity due to the transfer of antibodies across the placenta
   a. Innate resistance
   b. Naturally acquired active immunity
   c. Naturally acquired passive immunity
   d. Artificially acquired active immunity
   e. Artificially acquired passive immunity
7. The specificity o an antibody is due to
   a. Its valence
   b. The H chains
   c. The L chains
   d. The constant portions of the H and L chains
   e. The variable portions of the H and L chains

微生物學試題

8. In an agglutination test, eight serial dilutions to determine antibody titer were set up: Tube #1 contained a 1:2 dilution; tube #2, 1:4, and so on. If tube #5 is the last tube showing agglutination, what is the antibody titer?
   a. 5
   b. 1:5
   c. 32
   d. 1:32
9. In humans, B cells mature in the _____, and T cells mature in the _____.
   a. GALT, liver
   b. Bursa, thymus
   c. Bone marrow, thymus
   d. Lymph nodes, spleen
10. You have isolated a motile, gram-positive cell with no visible nucleus. You can assume this cell has
   a. Ribosomes
   b. Mitochondria
   c. an endoplasmic reticulum
   d. a Golgi complex
   e. all of the above

II. Define and explain each of the following: (30%)

1. Monoclonal antibody
2. Sterilization
3. Polymerase Chain Reaction (PCR)
4. Three-domain system
5. Gram stain
6. Endosymbiotic theory
7. Koch's postulates
8. Prion
9. Complement activation
10. Atomic force microscopy

III. Essay Questions (50%)

A. Draw and explain the function of the following items: (20%)

1. monotrichous
2. peritrichous
3. endospore
4. axial filament
5. capsure
6. fimbriae
7. staphylococci
8. streptococci
9. Gram(+) cell wall
10. Gram(-) cell wall

微生物學試題

B. If you wished to obtain a pure culture of bacteria that could degrade benzene and use it as a carbon and energy source, how would you proceed? (6%)

C. Calculate the mean growth rate and generation time of a culture that increases in the exponential phase from 385 to $1*10^8$ cells in 12 hours. (log 385= 2.585, log 2 = 0.301) (6%)

D. What are interferons? Discuss their roles in nonspecific resistance. (6%)

E. Compare and contrast the following aspects of endotoxins and exotoxins: bacterial source, chemistry, toxicity etc.(6%)

F. Draw a typical bacterial growth curve. Label and define each of the four phases.(6%)

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