

國立中央大學八十五學年度碩士班研究生入學試題卷

所別：生命科學研究所 不分組 科目：微生物學

共2頁 第1頁

I. 單選題：(每題二分，答案紙上請注明題號)

1. Bacteria were first seen detail by _____ in 1684.
 - a. Koch
 - b. Hooke
 - c. Leeuwenhoek
 - d. Pasteur
2. The fungi are the major cause of infectious diseases in
 - a. arthropods
 - b. plants
 - c. mammals
 - d. bacteria
3. Select the incorrect statement about protozoa.
 - a. They are animal-like
 - b. Most are multicellular.
 - c. An amoeba is an example
 - d. They have numerous organelles
4. The cyanobacteria were once called the
 - a. red algae
 - b. blue-green algae
 - c. green algae
 - d. blue algae
5. A bacterium possesses a transport system for a substrate in which the substance is chemically altered in the process. Which type of transport system is operating?
 - a. diffusion
 - b. active transport
 - c. group translocation
 - d. facilitated diffusion
6. At which stage of the aerobic utilization of glucose by a typical microbial cell is the most energy generated?
 - a. glycolysis
 - b. oxidative decarboxylation of pyruvate
 - c. Krebs cycle
 - d. the electron transport system
7. Which of the following methods likely would be the least satisfactory for maintaining a stock culture for an extended period of time?
 - a. storage of a plugged tube culture at ambient temperature
 - b. lyophilization
 - c. freezing in liquid nitrogen
 - d. storage of a tube culture under sterile mineral oil at ambient temperature
8. Most disease-causing microorganisms are
 - a. mesophiles
 - b. autiphiles
 - c. psychrophiles
 - d. thermophiles
9. Opportunists are microorganisms that
 - a. never cause disease
 - b. cause disease when the proper condition arises
 - c. constantly produce beneficial effects on the host
 - d. always cause disease
10. Which two terms describe catabolic pathways
 - a. breakdown, energy released
 - b. breakdown, energy stored



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- c. buildup, energy released
- d. buildup, energy stored
- 11. Denitrifiers change
 - a. nitrate to nitrite
 - b. nitrate to nitrogen gas
 - c. nitrogen gas to nitrate
 - d. nitrite to nitrate
- 12. Which bacterial genus has been used to clean up oil spills?
 - a. *Xanthomonas*
 - b. *Legionella*
 - c. *Pseudomonas*
 - d. *Enterobacter*
- 13. Each of the following describes coliform bacteria except
 - a. aerobic microorganism
 - b. facultative anaerobes
 - c. rod-shaped
 - d. spore-forming
- 14. Clonal selection explains how
 - a. antibodies binds to antigens
 - b. T cell differentiation
 - c. the blood passes through the body
 - d. the body produces many different antibodies
- 15. Each of the following is correct about rickettsiae except
 - a. Gram-negative bacteria
 - b. parasitize arthropods
 - c. tetracycline not effective in eradicating them
 - d. small and rod-shaped cells

II. 問答題：

1. *Bergey's Manual of Systematic Bacteriology* divides bacteria into four divisions based on cell wall composition. Please compare the cell wall composition between Gram-positive, Gram-negative bacteria, mycoplasma, and archaebacteria. (15 points)
2. Explain briefly the meaning of the following terms:
 - (a) Heterotrophs/Autotrophs (5 points)
 - (b) Chemolithotrophs (5 points)
3. What do you understand by the terms fermentation, aerobic respiration and anaerobic respiration? (10 points)
4. Discuss why viral chemotherapy has not progressed more rapidly. Structure your answer upon an outline of the stages of the infection cycle of a Human immunodeficiency virus, and indicate the prospects for interfering with the infection process at each step. (10 points)
5. Explain how monoclonal antibodies are produced, and how they may be used in diagnosis and immunotherapy. (10 points)
6. You desire to isolate a microorganism which is capable to degrade a toxic organic compound in from a contaminated site. Please design the experiments which would favor your attempts. (10 points)
7. How do you think the influence that advances in molecular genetics have had upon industrial microbiology? (5 points)

