

I. 單選題每題 1 分 ※ 注意：請於試卷內之「選擇題作答區」依序作答。

1. Which of the following processes does NOT generate ATP?
 - A. Photophosphorylation
 - B. Calvin-Benson cycle
 - C. Oxidative phosphorylation
 - D. Substrate-level phosphorylation
 - E. None of the above
2. All of the following are direct methods to measure microbial growth except
 - A. Direct microscopic count.
 - B. Standard plate count.
 - C. Filtration.
 - D. Metabolic activity.
 - E. MPN.
3. Which of the following treatments does not yield a sterile product?
 - A. 0.45 m filtration
 - B. Autoclaving
 - C. Gamma radiation
 - D. Pasteurization
 - E. 170°C for 2 hr.
4. According to the operon model, for the synthesis of an inducible enzyme to occur, the
 - A. End product must not be in excess.
 - B. Substrate must bind to the enzyme.
 - C. Substrate must bind to the repressor.
 - D. Repressor must bind to the operator.
 - E. Repressor must not be synthesized.
5. Plasmids differ from transposons because plasmids
 - A. Become inserted into chromosomes.
 - B. Are self-replicating outside the chromosome.
 - C. Move from chromosome to chromosome.
 - D. Carry genes for antibiotic resistance.
 - E. None of these.
6. Bacteria can acquire antibiotic resistance by
 - A. Mutation.

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- B. Insertion of transposons.
C. Acquiring plasmids.
D. All of the above.
E. None of the above.
7. Which of the following lacks a cell wall?
A. *E. coli*
B. *Mycoplasma*
C. *Mycobacterium*
D. *Clostridium*
E. *Penicillium*
8. Which of the following statements is false?
A. Fungi produce sexual spores.
B. Fungi produce asexual spores.
C. Fungal spores are used in identification of fungi.
D. Fungal spores are resting spores to protect the fungus from adverse environmental conditions.
E. Fungal spores are for reproduction.
9. Bacteriophages derive all of the following from the host cell except
A. Lysozyme.
B. tRNA.
C. Amino acids.
D. Nucleotides.
E. None of the above.
10. Which of the following statements is NOT true?
A. *E. coli* never causes disease.
B. *E. coli* provides vitamin K for its host.
C. *E. coli* exists in a mutual relationship with humans.
D. *E. coli* gets nutrients from intestinal contents.
E. None of the above.

II. 問答題每題 10 分

1. List five methods used to classify bacteria.
2. Compare and contrast photophosphorylation and oxidative phosphorylation.

3. Compare and contrast gram-positive and gram-negative cell walls with regard to (a) chemical composition, (b) reaction with Gram stain.
4. Describe how would you isolate a mutant that required proline for growth and was resistant to penicillin.
5. Describe the mechanism that a lysogenic λ phage is induced by UV irradiation (into a lytic cycle).
6. Why are adjuvants used in vaccines?
7. Describe the procedure for making monoclonal antibody.
8. In terms of basic differences between prokaryotic and eukaryotic cells, explain how an antibiotic might be selectively toxic to a bacterial cell (please give two examples).
9. Draw a bacterial cell and label all its identifiable parts.

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