

※ 注意：請於試卷內之「非選擇題作答區」作答，並應註明作答之題號。

I. Fill in the blanks (1 point each)

1. Immersion oil is used with some microscope lenses because it has the same _____ as glass.
2. The stain used to distinguish bacteria into two major groups is called _____ stain.
3. Ultraviolet light damages organisms, primarily by inducing the formation of _____ in DNA. These damages can be repaired by several methods such as _____ ...etc.
4. A bacterium which can grow in both aerobic and anaerobic environments is called _____.
5. During the _____ phase in a growth cycle, the rate of bacterial cell growth reaches to the maximum.

II. Compare each pair of the following terms: (4 points each)

1. transduction and conjugation
2. sterilization and pasteurization
3. plasmid and transposon
4. promoter gene and regulatory gene
5. flagella and pili

III. Answer the following questions (8 points each)

1. What are the archaea? Briefly describe the major characteristics to distinguish them from bacteria and eukaryotes.
2. An essential factor in the growth media for bacteria is phosphate. How many places can you cite where it is need?
3. Discuss two major roles of the citric acid cycle played in the cell?

IV. 解釋名詞 (每題 2 分, 共 10 分)

- (1) Viroids (2) Bt toxins (3) Type III secretion system (4) Homothallic fusion
(5) innate immunity

V. 列舉並簡單說明使真菌(fungi)成為無處不在之成功生物的 5 項特性。(10 分)

VI. *Agrobacterium* spp. 與 *Rhizobium* spp. 為同屬 α -*Proteobacteria* 之近親細菌, 但前者為植物病原菌而後者為植物共生益菌。(1) 分別簡述與其致病力與共生性相關之關鍵因子, (2) 從遺傳與分生層次探討其可能演化機制。(10 分)

VII. (1) 何謂活體寄生微生物(biotrophic microorganisms)? (2) 請列舉兩個活體寄生微生物例子, 並分別簡述其符合活體寄生微生物之特性。(10 分)

VIII. 列舉並說明動物與植物在抗病防禦機制上之兩項共同點與兩項差異點。(10 分)

試題隨卷繳回