I. Define the following terms (每題 2 分)

1. plasmid, 2. chemoautotroh, 3. transduction, 4. Achaea, 5. anaerobic respiration

II. Answer the following questions (每題 10 分)

1. Name the major contributions of the following scientists.
(a) Pasteur, (b) Koch, (c) Watson and Crick, (d) Gram,
(e) Jacob and Monod.
2. Draw a bacterial cell grow curve. Label and describe each growth phase.
3. What is *lac* operon? How does it control the cells of *Escherichia coli* to grow in the absent or presence of glucose?
4. Describe three different routes bacterial cell used to produce energy.

III. 從細胞層面與系統性層面比較病毒在感染植物寄主與動物寄主時關鍵相異點。(10 分)

IV. 關於植物病原菌 *Agrobacterium tumeficiens* 之 Ti plasmids：(1)請簡述其特性, (2)請敘述在農業科技之應用性。(10 分)

V. 列舉目前已發現之 Gram-negative 細菌 secretion systems，並簡述其功能。(12 分)

VI. 列舉四項真菌與細菌之不同點。(8 分)

VII. 解釋何謂 megagenomics，並說明在微生物學上之應用性。(10 分)

試題隨卷繳回