本科目不得使用計算機　　　　　　　　　　　　　　本科目試題共　1　頁

1. Please define the term **"bacteriophage"** and compare the **"lytic bacteriophage"** with **"lysogenic bacteriophage"**. List **three** possible applications of bacteriophage. (18%)

2. Please describe the **methods, procedures** and **mechanisms** how you could differentiate **aerobic** and **anaerobic** bacteria. (10%)

3. **Design experiments** to differentiate these two bacteria *Streptomyces coelicolor* and *Pseudomonas aeruginosa* and describe the **basic concepts** as to why you choose these methods and **the proposed results**. (10%)

4. **Oomycetes** form a distinct phylogenetic lineage of fungus-like microorganisms. Please describe and contrast **Oomycetes** and **true fungi** based on their characteristics of **hyphae structure, reproductive structures**, and **cell wall compositions**. (12%)

5. Please explain what vaccination is, and use an example to describe the efficacy of vaccination in the management of microbial diseases. (6%)

6. Please **match** the following components/structures (**by letters**) with each **microbial genus.** (20%)
   A. cell wall contains mycolic acids; B. cell wall contains teichoic acids; C. cell wall contains lipopolysaccharides; D. cell wall contains cellulose; E. cell wall contains chitin; F. 80S ribosome; G. nucleus; H. peptidoglycan; I. endospore; J. FtsZ; K. porin; L. *16S rRNA*.
   (1). *Penicillium*
   (2). *Phytophthora*
   (3). *Escherichia*
   (4). *Mycobacterium*
   (5). *Bacillus*
   (6). Spiroplasma
   (7). *Staphylococcus*
   (8). *Xanthomonas*

7. Please describe the **function(s)** of the following chemicals in microbiology (10%).
   (1). Tetracycline
   (2). Bromothymol blue (BTB)
   (3). Triphenyltetrazolium chloride (TTC)
   (4). Phenolphthalein diphosphate (PDP)
   (5). Crystal violet

8. Please describe the functions of the following **differential medium** in microbial diagnosis. (14%)
   (1). King'B medium
   (2). MacConkey agar
   (3). CVP medium
   (4). Tween 80 medium
   (5). Starch medium
   (6). Blood agar
   (7). Casein medium