

※ 注意：請於試卷內之「非選擇題作答區」依序作答，並應註明作答之大題及小題題號。

第一大題(30分) 答案請填寫於答案本中

一、單選題，每題二分(共8分)

- Which property or structure is shared by all extrachromosomal plasmids in bacteria?
 - Self-transmissibility from one bacterial cell to another
 - Genes that impart resistance to antibiotics
 - Genes that allow utilization of organic compounds
 - An origin for autonomous replication
 - Genes that produce toxins
- For transferring genetic materials through conjugation, plasmid mobilization is determined by?
 - oriV
 - incompatibility group
 - oriT
 - integration in chromosome
 - a prime factor
- Which of the following statement about "Biofilm" is not true?
 - Dental plaque is a typical biofilm on tooth surface
 - Biofilm is composed of bacteria and bacterial products
 - Glucans of *Streptococcus mutans* are found in the biofilm
 - Glucose is substrate for glucan synthesis by glucosyltransferase
 - α -1,3 linken forms of glucans contribute to the bacterial aggregation
- 關於 tinea capitis，下列何者為錯誤配對？
 - T. tonsurans* : endothrix
 - T. schoenleinii* : favic
 - M. canis* : ectothrix
 - T. violaceum* : ectothrix
 - T. mentagrophytes* : ectothrix

二、配合題(每題1分，可複選，共6分)

1. 與疾病有關之致病原 (選擇右側最適合的選項)

- | | | |
|------------------------|---|---------------------------------|
| (1) Lyme disease | ① <i>Mycoplasma pneumoniae</i> | ② <i>Leptospira interrogans</i> |
| (2) Atypical pneumonia | ③ <i>Ureaplasma urealyticum</i> | ④ <i>Borrelia burgdorferi</i> |
| (3) Syphilis | ⑤ <i>Treponema pallidum subspecies pallidum</i> | ⑥ <i>Borrelia recurrentis</i> |

2. 引起疾病之感染途徑 (選擇右側最適合的選項)

- | | | |
|-------------------|----------------------------------|---------------------|
| (1) Syphilis | ① exposure to contaminated water | ② blood transfusion |
| (2) Leptospirosis | ③ tick bite | ④ mosquito bite |
| (3) Lyme disease | ⑤ sexual contact | ⑥ fecal-oral |
| | ⑦ aerosol | |

三、填充題(每題1分，共5分)

下列敘述，那些適合於 Gram-positive bacteria？那些適合於 Gram-negative bacteria？

若該敘述適合於 Gram-positive bacteria，則在答案卷上註記該題號並填入“+”註記；

若該敘述適合於 Gram-negative bacteria，則在答案卷上註記該題號並填入“-”註記

- | | |
|------------------------------|-------------------------|
| 1. 細胞壁具有 teichoic acid | 2. 細胞壁含有大量的 lipoprotein |
| 3. 對 penicillin 較具抗性 | 4. 具有 outer membrane |
| 5. cell wall 較易被 lysozyme 破壞 | |

四、簡答題 (11分)

- 細菌感染造成疾病，是細菌與宿主交互作用後的結果；請舉出細菌三種致病機制或致病因子 (3分，不必說明)。
- What is the common mechanism of action for staphylococcal α , β , γ , δ and leukocidins (2%)?
- (1) Name one mechanism that bacteria use to become resistant to β -lactam antibiotics. (2%)
(2) What can you do to solve the problem that you just listed in question 3(1)? (2%)
- 血液培養基上的 *Streptococcus spp.* 依溶血性可區分成 α 與 β 型，請回答判讀方法及其溶血程度(2%)?

見背面

第二大題(30%) 答案請填寫於答案本中

1. 試列舉三種可作為病毒分類基礎之病毒基本構造? (3%)
2. 請寫出台灣最近五年內所出現之三種新興病毒感染症(new emerging infectious disease)，其致病病毒名稱，及實驗室進行確診之方法。(10%)
3. 一種已被印證能有效控制病毒“A”於細胞內繁殖之藥物“Y”，有部份病患經一段時間持續治療後由原本有效轉為無效反應，試述可能原因? 如何提供實驗證據印證此可能原因? (7%)
4. 試列舉兩種可能導致癌症產生之病毒?各引起何種癌症?其致癌機轉為何?此過程中發炎反應(inflammation)所扮演之可能角色為何? (10%)

第三大題(40%) 答案請填寫於答案本中

1. 解釋名詞(各3分)
 - A. Toll-like receptor
 - B. Regulatory T cell
 - C. positive selection
 - D. clonal selection
 - E. Affinity maturation
 - F. epitope
2. When microorganisms invade, which of the following cytokine will be induced first: (單選, 3分)
 - A. IL-1
 - B. IL-2
 - C. IL-4
 - D. IL-12
 - E. IL-17
3. Which of the following vaccine is most effective in preventing infection? (單選, 3分)
 - A. live attenuated virus
 - B. heat killed virus
 - C. genetically engineered recombinant viral virulent proteins
 - D. DNA vaccine encoding viral proteins
 - E. none of the above, it depends case by case
4. 配合題: pick up the right answer from the right list (單選, 共16分)

(1) invariant chain	(A). MHC class I antigen presentation
(2) tumor antigens	(B). MHC class II antigen presentation
(3) PGYAVEDGGMLL peptide	(C). non classical MHC antigen
(4) bacterial antigens	(D). antigen binding sites in T cell receptor (TCR)
(5) hypermutation	(E). NK cell receptor
(6) RAG-1	(F). Initiate the cutting of recombination sequence-specific DNA cleavage during Ig gene rearrangement
(7) anaphylaxis	(G). affinity maturation
(8) tuberculin test reaction	(H). generation of memory cells
	(I). Class switching
	(J) Type I hypersensitivity
	(K) Type II hypersensitivity
	(L) Type III hypersensitivity
	(M) Type IV hypersensitivity