第一部分

Single Choice (2 points each)(請填寫於選擇題作答區)

1. Regarding to the properties of primary and secondary antibody response, which statement is CORRECT? (A) Primary response requires lower dose of antigen than the secondary response (B) The major isotype found in the primary response is IgG (C) Antibody affinity is lower in the primary response (D) Time required to elicit antibody is longer in the secondary response
2. Regarding to the function of different antibody, which statement is CORRECT? (A) IgA is the major antibody in the milk (B) IgG has the greatest ability to activate complement system (C) IgD sensitizes mast cells, leading to allergic reaction (D) IgM has only soluble form but not membrane form
3. Cytotoxic T cells use which molecules to kill target cells? (A) Perforin (B) Complement (C) IL-2 (D) Antibody
4. Which cell type is not a professional antigen presenting cells? (A) Macrophage (B) Dendritic cell (C) T cells (D) B cells
5. Which statement is CORRECT? (A) Th1 cells secret IL-4, IL5 and IL10 (B) Th2 cells are critical for cellular immunity (C) Th1 and Th2 cells are not involved in antibody class switching (D) IL-4 is an important cytokine to drive Th2 response
6. Which statement is CORRECT? (A) NK cells, neutrophils and Macrophages belong to innate immunity (B) Initiation of innate immunity is later than adaptive immunity (C) Innate immunity can memorize the pathogens and have quick response in the second infection (D) Specificity is one major feature of the innate immunity
7. Regarding to acquired immunodeficiency syndrome (AIDS)/HIV, which statement is CORRECT? (A) HIV attacks CD8 T cells (B) AIDS happens immediately after the infection of HIV (C) AIDS patients mainly die of infection of opportunistic pathogens (D) Vaccination against HIV is easy
8. Which statement regarding to development of immune system is CORRECT? (A) Bone marrow is the stem cells of B but not T cells (B) Thymus has three different kinds of T cells, namely $CD4^+CD8^+$, $CD4^+CD8^-$ and $CD4^-CD8^+$cells (C) Hematopoietic stem cells give rise to both lymphoid and myeloid lineages (D) Bone marrow transplantation can only correct defects in T cell development
9. Which statement is CORRECT? (A) CD4 T cells recognized MHC class I-peptide complex on antigen presenting cells (B) MHC I presents endogenous antigens (C) Antigen presenting cells can present whole pathogens through MHC (D) One T cell receptor can recognize two different peptides presented by different MHCs
10. Which cells do not belong to the immune system? (A) T cells (B) Monocytes (C) Epithelial cells (D) Dendritic cells

第二部分

1. 請問細菌抗藥性基因 (antibiotic resistance gene)，在同類或不同類細菌間彼此傳遞的方式有那些。(10%)
2. 請列舉二個能造成生化攻擊武器的細菌及其毒性因子。(10%)

接背面

第三部分

1. What are the causative microorganisms for the following diseases (1% each, total 3%):
   a. Legionellosis
   b. Tuberculoid leprosy
   c. Spongiform encephalopathy
2. Please explain the following terms (2% each, total 4%):
   a. Adenylate cyclase toxin
   b. Zoonosis
3. Please describe briefly the mechanisms of action for tetracycline, rifampin and quinolone (6%)?
4. What is underlying mechanism for the formation of "pseudomembrane" during the pathogenesis of *Corynebacterium diphtheriae* (3%)?
5. Genomic information has made advanced tremendously in the recent years. What will you take advantage of the newly gathered information to advance your field of research (e.g. pathology, oral and environmental biology) (4%)?

第四部分

I. 配合題(單選題)：請將右邊最合適選項配對寫在非選擇題作答區上(10%)

1. Herpes simplex virus 1	A) Chicken Pox
2. Varicella-Zoster	B) Infant Diarrhea
3. Pox virus	C) Cervical Cancer
4. Hepatis D virus	D) Congenital defect
5. Rota virus	E) Vaccinia
6. Rubella virus	F) Trigemenial ganglia
7. Adenovirus	G) Hand-foot and mouth disease
8. Coxackie A virus	H) Defective virus
9. Human papilloma virus	I) Hemorrhagic fever
10.Dengue virus	J) Conjunctitis

II. 在某一離島的調查資料顯示，當地居民膀胱癌發生率較該國其它區域居民高出 3.5 倍，且有家族群聚性。如果懷疑此癌症的發生和某種經由體液傳染的 HXV 有關。請設計一系列實驗，查證其相關性。(10%)

第五部分

1. 試述 retrovirus 之 life cycle，其感染細胞後 viral RNA 如何進行 replication 再被釋放到細胞外 (6%)？此 virus replication 之特性如何應用於 cell transfection 之實驗來表現外送基因到細胞內，其優點為何 (3%)？此特性如何經由 LTR retrotansposon 方式對人類基因體之演化造成影響，影響為何 (3%)？
2. 致病微生物感染人體細胞後，試述宿主細胞用以對抗其繁衍及散播所誘發之 defense mechanism 有哪些(5%)？微生物用以逃避這些 host defense mechanism 之方式為何，試舉例說明(3%)？

試題隨卷繳回