Part I. 單選題 (每題 2 分，共 20 分)

1. The number of protein coding genes is approximately in human
(A) 10000 to 20000
(B) 20000 to 300000
(C) 30000 to 40000
(D) 40000 to 50000
(E) None of the above

2 Obesity may be associated with which of the following problems?
(A) Insulin resistance
(B) Inflammatory reaction
(C) Hypertension
(D) None of the above
(E) All of the above

3. The prevalence of which of the following cancers is increasing all over the world?
(A) Ovarian cancer
(B) Sarcoma
(C) Breast cancer
(D) Lymphoma
(E) None of the above

4. The anterior lobe of pituitary releases which of the following hormones?
(A) Follicle-stimulating hormone and luteinizing hormone
(B) Oxytocin and vasopressin
(C) Insulin and glucagons
(D) Gastrin
(E) Epinephrine and nor epinephrine

5. A woman is a carrier of X-linked hemophilia. What is the possibility of being affected by hemophilia for her son?
(A) 25%
(B) 50%
(C) 100%
(D) 0%
(E) None of the above

(背面仍有題目,請繼續作答)

6. The component of adult hemoglobin (HbA) is

(A) α2β2

(B) α2γ2

(C) α2δ2

(D) δ2 γ2

(E) None of the above

7. Which of the following cancer is caused by oncogenic virus?

(A) Breast cancer

(B) Cervical cancer

(C) Endometrial cancer

(D) Retinoblastoma

(E) Gastric cancer

8. Which of the following immunoglobulins is most rapidly produced in reaction to the antigen?

(A) IgM

(B) IgG

(C) IgA

(D) IgE

(E) IgD

9. Which of the following bacteria is the pathogen of gastric ulcer?

(A) E coli

(B) Helicobactor pylori

(C) Vibro Cholerae

(D) Mycobacterium tuberculosis

(E) Salmonella typhi

10. Which of the following diseases is caused by autoimmune dysfunction?

(A) Miscarriage

(B) Cancer

(C) Systemic lupus erythematosus

(D) Gastic ulcer

(E) Osteoarthritis

Part II. 問答題 (共 80 分)

1. Please describe the role and mechanism of microRNA in cells (10 分)

2. Please answer the following questions

(1) What is genome imprinting? (3 分)

(2) Give four human chromosomes on which imprinting genes are located (4 分)

(3) Give the names of three imprinting syndromes in human (3 分)

3. Please explain the following items (2 分 for each item)

(1) Pluripotency

(2) Totipotency

(3) Multipotency

(4) Therapeutic cloning

(5) Reproductive cloning

4.

(1) Please describe 5 examples of histone modification (5 分)

(2) Describe how histone code regulates gene expression (5 分)

5. Describe the role of mitochondria plays in programmed cell death (10 分)

6. Please describe the primary, secondary, tertiary and quaternary structures of proteins (10 分)

7.

(1) Provide definition of the oncogene and 5 examples of oncogenes (5 分)

(2) provide definition of the tumor suppressor gene and give 5 examples of tumor suppressor genes (5 分)

8.

(1) Provide one example of cancer target therapy which is based on one of the growth factor signaling pathways (5 分)

(2) Provide one example of cancer target therapy which is designed to block angiogenesis (5 分)