1. Giving two sorting algorithms, quick sort and bubble sort, each with time complexity $O(n\log^n)$ and $O(n^2)$ respectively. (20%)

2. Consider the following algorithm(20%)

   Algorithm Fun1(x)

         If x=1 or x=0

             Return 1

         else

             return Fun1(x-1)+Fun1(x-2)

   end Fun1

   What would be returned if Fun1 is called as: (a) Fun1(8)

                                          (b) Fun1(12)

3. (a) In computer networking, what are the seven protocol layers in the OSI reference model? (10%)

   (b) which protocol layer is defined to handle routing? (5%)

   (c) which protocol layer is defined to deal with how signals (bits) are transmitted? (5%)

4. 畫圖(實際排列), 求出並說明 $4P_2$ 與 $4C_2$ (排列與組合) (10%)

5. Describe the major difference between the main memory and second memory in a PC. (10%)

6. RSA 是公開金鑰系統, 若你的公開金鑰 (e, n)=(7, 187), 今我有一

   明文 M=88 要用你的金鑰 e 加密成密文 C 傳給你, 請求出密文

   C 是多少? (10%)

   (Hint: $C=M^e \bmod n$, mod 爲 求餘數之意, 如 8 = 3 mod 5)

7. If $(130)_x=(28)_{10}$, find the value of x. (x is a positive number, 10%)