

國立嘉義大學九十三年學年度

資訊工程學系碩士班招生考試試題

科目：計算機概論

1. Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use non-preemptive scheduling and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

What is the average turnaround time for these processes with the

- (a) FCFS scheduling algorithm. (10%)
 (b) SJF scheduling algorithm. (10%)
2. Consider the following resource-allocation policy. Requests and releases for resources are allowed at any time. If a request for resources cannot be satisfied because the resources are not available, then we check any processes that are blocked, waiting for resources. If they have the desired resources, then these resources are taken away from them and are given to the requesting process. The vector of resources for which the waiting process is waiting is increased to include the resources that were taken away.
- (a) Can deadlock occur? If so, give an example. If not, which necessary condition cannot occur? (10%)
 (b) Can indefinite blocking occur? Please explain. (10%)
3. Complete the following table for the different protocols. Answer yes or no. (10%)

Characteristic	ALOHA	CSMA/CD	CSMA/CA	Token Passing
Multiple Access	yes	yes	yes	no
Carrier sense				
Collision checking				

4. (a) The following program segment is designed to compute the product of two nonnegative integers X and Y by accumulating the sum of X copies of Y; that is, 3 times 4 is computed by accumulating the sum of three 4s. Is the program segment correct? Explain your answer. (15%)

```

Product  0;
Count    0;
repeat {Product  Product + Y,
        Count    Count + 1}
until (Count = X)
    
```

- (b) What sequence of numbers is printed by the following algorithm if it is started with input values 0 and 1? (10%)

```

procedure MysteryWrite (Last, Current)
if (Current < 100) then
    {print the value assigned to Current;
    Temp  Current + Last;
    apply MysteryWrite to the values Current and Temp}
    
```

5. (a) A 12-bit Hamming-code word containing 8 bits of data and 4 parity bits is read from memory. What was the original 8-bit data word that was written into memory if the 12-bit word read out is as follows: (10%)
- (1) 111111110100
 (2) 010011001010
 (3) 101110000110
- (b) A sequential circuit has one flip-flop, Q; two inputs, x and y; and one output, S. It consists of a full-adder circuit connected to a D flip-flop, as shown in figure 1. Derive the state table and state diagram of the sequential circuit. (15%)

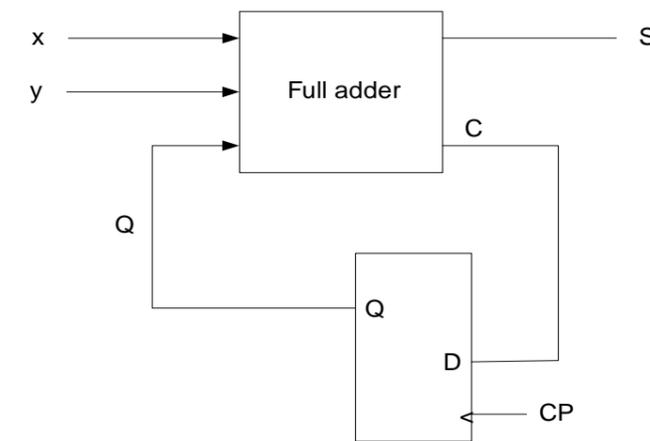


figure 1