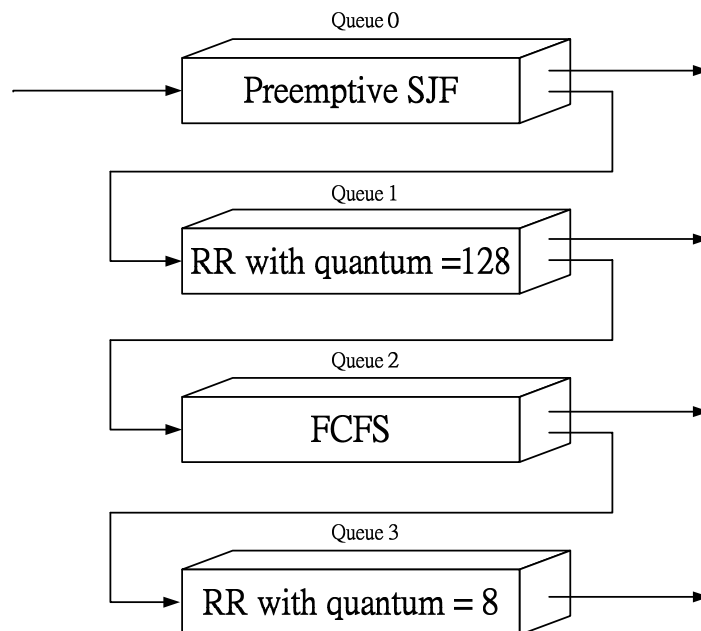## 科目： 作 業 系 統 (Operating System) 第一頁 共二頁（page 1 of 2）

1. (10 ％) Suppose a thread is running in a critical section of code. It means that the thread has acquired all the locks through proper arbitration. Can this thread get context switched? Please explain the reasons.

2. (15 %) The following figure shows a multilevel-feedback-queue scheduler with four queues, numbered from 0 (the highest priority) to 3 (the lowest priority). The scheduler first executes all processes in queue 0. Processes in queue j will only be executed if queues i, for all $i < j$, are empty. A process that arrives for higher priority queue will preempt a process in lower priority queues.

   (a) (7%) Please explain what happens for the scheduler.

   (b) (8%) Please modify the scheduler so as to overcome its disadvantages.

3. (15 ％) Are the following statements about IP addresses true or false? Be sure to justify your answer for false statements. For each statement, you will get 3 points for correct answer, zero point for blank, or ‑1 point for incorrect answer.

   (a) Domain Name Service (DNS) can be used to acquire IP addresses.

   (b) Address Resolution Protocol (ARP) can be used to acquire IP addresses.

   (c) Network Address Translation (NAT) is used to map MAC addresses to IP addresses.

   (d) IP Multicasting is adopted in Dynamic Host Configuration Protocol (DHCP).

   (e) IPv6 addresses are 128 bits long.

4. (10 ％) What is the difference between deadlock prevention and deadlock avoidance?

5. (10%)What problems could occur if a system allowed a file system to be mounted simultaneously at more than one location?

6. (10%)Explain why it is easier to share a reentrant module using segmentation than it is to do so when pure paging is used?

7. (10%)In the consumer-producer example program, a ring buffer queue is used to store the produced item that will be consumed by the consumer later. In what conditions the program need not to use the lock synchronization primitive to support correct operation ?

8. (10%)Define the difference between preemptive and nonpreemptive scheduling. Explain why strict nonpreemptive scheduling is unlikely to be used in a computer center.

9. (10%)What protection problems may arise if a shared stack is used for parameter passing?