Nepal College of Information Technology

**Unit Test**

Fall 2012

Program : BE IT Time : 2 hrs

Semester : (V) FM : 70

Subject : Applied Operating Systems PM : 35

* *Candidates are requested to give their answer as far as practicable in their own words.*
* *The figure in the margin indicates the full marks*
* ***Attempt ALL question***

1. Tick the correct questions. (7 points, 1 point each)

a) Which statement about resource is FALSE?

i) A process must request a resource before using it.

ii) The operating system can provide resources.

iii) A process must be blocked before requesting a resource.

iv) A process its operation until a requested resource is allocated.

b) Basic process states include the following EXCEPT

i) Blocked

ii) Running

iii) Ready

iv) Killed

c) Regardless of the type of the computer system, all scheduling algorithms are measured to see if they

i) Are fair

ii) Are nice

iii) Have good response time

iv) Meet deadlines

d) Non preemptive scheduling strategies include the following EXCEPT

i) FCFS

ii) Shortest Job Next

iii) Priority

e) In the reader writer problem processes p and q are allowed to simultaneously access the shared resource if and only if

i) p and q both are reading

ii) p and q both are writing

iii) p is reading and q is writing or vice versa

iv) None of the above

f) Round Robin scheduling is essentially the preemptive version of

i) FIFO

ii) SJF

iii) Shortest Time Remaining First

g) Switching the CPU to another Process requires to save state of the old process and loading new process state is called as

i) Process Blocking

ii) Context Switch

iii) Time Sharing

iv) None of the above

2. True / False , Write T for True and F for False (5 points, 1 point each)

a) Race condition cannot occur on a uniprocessor. \_\_\_\_\_

b) SJF can be implemented as a priority algorithm, where the priority is determined by the arrival time of the job. \_\_\_\_\_\_

c) A process in the Ready state can only transition to Running state.\_\_\_\_

d) The value of a semaphore represents how many processes are waiting for a common resource. \_\_\_\_\_\_\_

e) Setting the program counter register is a privileged instruction.\_\_\_\_\_\_

3. Why it is important for the scheduler to distinguish I/O bound programs from the CPU bound programs. (2 points)

4. What is the meaning of the term busy waiting? Can busy waiting be avoided? Explain your answer. (5 points)

5. What is the purpose of system call? (2 points)

6. Joe Smart says “If you want to schedule processes to minimize the TOTAL wait time of all processes, it is quite easy. Just use the shortest Job First rule.” *First explain what Joe means. Then prove or argue why Joe is right. Finally discuss the issues raised by this Smart ides and how we can resolve them*. (10 points)

7. Consider the following set of processes, with the length of CPU burst time given in milliseconds.

Processes CPU Burst Priority

A 100 3

B 40 1(Highest)

C 80 2

D 20 4(Lowest)

The processes are assumed to have arrived in the order A, B, C and D all at time 0.

a) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a nonpreemptive priority and RR (quantum = 20 ) scheduling. (6 points)

b) What is the turnaround time of each process for each of the scheduling algorithms in part a? (6 points)

c) What is the waiting time of each process for each of the scheduling algorithms in part a? (6 points)

d) Which of the schedule in part a result the minimal average waiting time (over all processes)? (2 points)

8. What is the critical section problem? List and state the three requirements that a solution to the critical section problem must satisfy. (5 points)

9. Suppose the memory contents from 30 to 39 are “need silence in class, keep city clean”. Then our OS found the instruction LR36SR30PD30 in job card then what will be the result after these three instructions. Note there are two spaces between comma and keep and others are by default one space separator. (10 points)

10 Write short notes on (4 points, 2 points each)

a) Batch System

b) Time Sharing System