Ajay Kumar Garg Engineering College, Ghaziabad

Department of MCA

Sessional Test-2

Course: MCA
Session: 2017-18
Subject: OS
Max Marks: 50

Semester: III
Section: MCA-1 & 2
Sub Code: RCA-301
Time: 2 hour

Note: Answer all the sections.

Section-A

A. Attempt all the parts.

(5 X 2 = 10)

1. What is a process? What are attributes of a process?
2. What is context switching?
3. What are necessary conditions for deadlock to occur?
4. Define binary semaphores.
5. What is the relationship between threads and processes?

Section-B

B. Attempt all the parts.

(5 X 5 = 25)

6. Draw the process state diagram and describe the various process states.
7. Explain different kinds of threaded models.
8. What is PCB? What kind of information is stored in PCB?
9. Explain the differences in the degree to which the following scheduling algorithms discriminate in favor of short processes: a) First Come First Served b) Round Robin c) Multilevel feedback queues.
10. Consider the following snapshot of a system:

	Max	Allocation	Available
	A B C	A B C	A B C
P_0	0 0 1	0 0 1	
P_1	1 7 5	1 0 0	
P_2	2 3 5	1 3 5	
P_3	0 6 5	0 6 3	
Total		2 9 9	1 5 2

Answer the following questions using the banker's algorithm:
a) What is the content of the matrix Need?

b) Is the system in a safe state?

Section-C

C. Attempt all the parts.   (2 X 7.5 = 15)

11. Explain readers' writers' problem. Give the solution of this problem with the help of semaphores.

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

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

a) Draw two Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1).

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

c) Which of the algorithms of part a results in the minimum average waiting time (over all processes)?