

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1296 Roll No. 1 2 4 5 9 1 4 0 6 1

MCA

(SEM. III) ODD SEMESTER THEORY
EXAMINATION 2013-14
OPERATING SYSTEMS

Time : 3 Hours

Total Marks : 100

Note :- Attempt all questions from each Section as indicated.

SECTION-A

1. Attempt all questions : (2×10=20)
- (a) Define dispatcher.
 - (b) What is response time ?
 - (c) What is starvation ?
 - (d) How multilevel feedback queue scheduling is different from multilevel queue scheduling ?
 - (e) What are mutex locks ?
 - (f) Describe claim edge with respect to resource-allocation graph.
 - (g) What are monitors ?
 - (h) Write the difference between hard and soft real time operating system.
 - (i) What is a thread ? How is it different from a process ?
 - (j) What is the role of request manager in LINUX ?

SECTION-B

2. Attempt any **three** questions : (10×3=30)
- (a) (i) What is the main purpose of operating system ? Discuss its various services.
 - (ii) What are system calls ? Describe any five system calls.
 - (b) (i) Define process. Explain the process states with a suitable diagram.
 - (ii) Define deadlock. Give four conditions for the occurrence of deadlock. How it can be prevented ?
 - (c) (i) Explain multiprocessor scheduling. Differentiate between symmetric and asymmetric multiprocessing.
 - (ii) What is PCB ? How the operating system maintains the state of a process using PCB ?
 - (d) (i) Explain the concept of virtual machines.
 - (ii) Show that if the wait and signal operations are not executed atomically, then mutual exclusion may be violated.

SECTION-C

Note :- Attempt all questions. (10×5=50)

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

<u>Process</u>	<u>Burst Time</u>	<u>Arrival Time</u>
P1	8	0.0
P2	4	0.4
P3	1	1.0

Calculate average waiting time and average turn around time for FCFS and non preemptive SJF scheduling.

OR

What is semaphore ? How the variable can be used to deal with the problem of critical section ? Give the solution of Dining-Philosopher problem using Semaphore.

4. Consider the following snapshot of a system :

	<u>Allocation</u>			<u>Max</u>			<u>Available</u>		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	4	3	2	3	0
P1	3	0	2	0	2	0			
P2	3	0	2	6	0	0			
P3	2	1	1	0	1	1			
P4	0	0	2	4	3	1			

Answer the following questions using Banker's algorithm :

- What is the content of matrix need ?
- Is the system in safe state ?
- If a request from process P1 arrives for (0 2 0), can the request be granted immediately ?

OR

When do page faults occur ? Describe the action by the operating system when a page fault occurs.

5. Consider the following page reference string :

1, 2, 3, 4, 2, 4, 5, 6, 3, 1, 2, 3, 4, 6, 4, 5, 2, 6.

Calculate number of page faults using LRU and optional page replacement algorithms. Assume number of frames as three.

OR

What is a file ? Discuss the various mechanisms provided by operating system to access a file.

6. What is access Matrix ? Why an operating system needs access matrix ? What are the various techniques to implement it ?

OR

What is thrashing ? How it occurs ? Discuss techniques that are used to overcome thrashing.

7. Describe memory management and file system of LINUX.

OR

Discuss FCFS, SSTF and SCAN disk scheduling algorithms.