(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 despatcher.

   (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 :

Process	Burst Time	Arrival Time
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 :

	Allocation			Max			Available		
	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 :

(i) What is the content of matrix need ?

(ii) Is the system in safe state ?

(iii) 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.