



May- June - 2011

[3963] – 361

T.E. (Information Technology) (Semester – I) Examination, 2011
OPERATING SYSTEMS (New)
(2008 Pattern)

Time: 3 Hours

Max. Marks: 100

- Instructions :** 1) Answer **three** questions from **each** Section.
2) Answers to the **two** Sections should be written in **separate** answer books.
3) Figures to the **right** indicate **full** marks.
4) **Neat** diagrams must be drawn **wherever** necessary.
5) Assume suitable data, wherever **necessary**.

SECTION – I

1. a) Explain the following terms : 8
1) System Call
2) Multiprogramming
3) Multiprocessing
4) Mode Switch
b) State different architectures of Operating systems and explain Monolithic architecture in detail. 8

OR

2. a) Explain the following terms 8
1) Shell variables 2) Bash debugger
3) Functions in the shell 4) Structure of AWK program
b) Explain Modern Unix Kernel with a neat diagram. 8
3. a) Differentiate between program and process. Explain with neat diagram contents of a UNIX process image. 10
b) Explain the concept of thread. Compare user-level threads and kernel-level threads. 8

OR

P.T.O.



4. a) Consider three processes, all arriving at time zero, with total execution time of 10, 20, 30 units, respectively. Each process spends the first 20% of execution time doing I/O, the next 70% of time doing computation, and the last 10% of time during I/O again. The operating system uses a shortest remaining compute time first scheduling algorithm and schedules a new process either when the running process gets blocked on I/O or when the running process finishes its compute burst. Assume that all I/O operations can be overlapped as much as possible. For what percentage of time does CPU remain idle ? Explain in detail with Gantt Chart. 8
- b) State different types of scheduling. Explain RR scheduling with example. 10
5. a) Explain with definitions the concept of general semaphores and binary semaphores. 8
- b) What are the ways to implement Semaphores ? 8

OR

6. a) How is deadlock prevented ? 8
- b) Consider the following state of the system. Determine if this system is in the safe state or not. 8

	R1	R2	R3
P1	3	2	2
P2	6	1	3
P3	3	1	4
P4	4	2	2

Claim matrix C

	R1	R2	R3
P1	1	0	0
P2	6	1	2
P3	2	1	1
P4	0	0	2

Allocation matrix A

	R1	R2	R3
P1	2	2	2
P2	0	0	1
P3	1	0	3
P4	4	2	0

C - A

R1	R2	R3
9	3	6

Resource vector R

R1	R2	R3
0	1	1

Available vector W

(a) Initial state



SECTION – II

7. a) A process references pages in the following order 10

2 3 2 1 5 2 4 5 3 2 5 2

Use FIFO and LRU page replacement algorithms to find out the number of page faults for the above reference string using 3 page frames.

- b) Explain the concept of Demand Paging with the help of neat diagram. 8

OR

8. a) Explain the different memory management requirements. 8

- b) Explain different placement algorithms for dynamic partitioning. 10

9. a) Explain File system Architecture in detail. 8

- b) Explain the concept of File Sharing. 8

OR

10. Assume that a disk is having 200 tracks. The disk head is initially located at track 100 and that the disk request queue has random requests in it. The requested tracks, in the order received by the disk scheduler, are 55, 58, 39, 18, 90, 160, 150, 38, 184. Find the average seek length for following disk scheduling algorithms with diagrams. 16

1) SCAN 2) C-SCAN 3) SSTF 4) FIFO

11. a) Describe two approaches to intrusion detection. What does an audit record contain ? 8

- b) How is security implemented in UNIX ? 8

OR

12. a) Explain the Authentication in detail. 8

- b) How is security implemented in Windows 2000 ? 8