



T.E. (Information Technology) (Semester – I) Examination, 2010
OPERATING SYSTEMS (New)
(2008 Course)

Time : 3 Hours

Max. Marks : 100

- Instructions :** 1) Answer *all* questions for *each* Section.
2) Answer to the *two* Sections should be written in *separate* books.
3) Neat diagrams must be drawn *whenever* necessary.
4) Figures to the *right* indicate *full* marks.

SECTION – I

1. A) What is the purpose of system calls and how do the system calls relate to operating system ? 8
B) What is an operating system ? State and explain the basic functions of operating system. 8

OR

- A) Discuss various architectures of operating system. 8
B) Write a shell script for sorting a given list of numbers using bubble sort. 8
2. A) List the information in process control block and explain it. 8
B) What is a thread ? Define User Level Thread (ULT) and Kernel Level Thread (KLT). How is ULT mapped to KLT ? 8

OR

- A) Consider the following processes 12

Processes	BT	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are arrived in order P1 to P5 all at 0

- i) Draw Gantt chart to show the execution using FCFS, SJF, non pre-emptive priority (smaller priority number implies higher priority)
ii) Calculate average TAT & WT.
B) Explain real time scheduling. 4



3. A) List the requirement of Mutual Exclusion. 6

B) Write a semaphore solution for readers-writers problem. 6

C) Apply the Deadlock Detection Algorithm for following example and show the results

Available [2 1 0 0]

Request **Allocation**

2 0 0 1 0 0 1 0

1 0 1 0 2 0 0 1

2 1 0 0 0 1 2 0

OR

A) What is the difference among deadlock avoidance, detection and prevention ? 8

B) Write a semaphore solution for dining philosophers problem. 6

C) Explain monitors in brief. 4

SECTION – II

4. A) Draw a graph of degree of multiprogramming verses CPU utilization. Explain the nature of graph. 6

B) Explain with the help of a neat diagram how TLB can be used to improve Effective Access Time. 10

OR

4. A) What are the common techniques for structuring the page table ? Explain at least three of the techniques. 10

B) For the following reference string.

5, 6, 7, 8, 5, 6, 9, 5, 6, 7, 8, 9

Count the number of page faults that occur with 3 frames and 4 frames using FIFO page replacement method. Discuss the result. 6



5. A) A disk drive has 500 cylinders, numbered 0 to 499. The drive is currently serving a request at cylinder 255 and the previous request was at cylinder 143. the queue of pending requests in FIFO order is :

84, 147, 91, 177, 286, 341, 78, 488, 38, 130.

Starting from current head position, what is the total distance that the disk arm moves to satisfy all pending requests for each of the following disk scheduling algorithms.

- 1) FCFS
- 2) SSTF
- 3) LOOK. 9

- B) Explain various allocation methods for storage of files on disk. 9

OR

5. A) Discuss the following :

Directory Structure

File Sharing. 9

- B) Describe free space management techniques with suitable example. 9

6. A) Discuss the security in Unix. 8

- B) What is the difference between a threat and an attack ? Explain with example. 8

OR

- A) Explain techniques and security policies to improve the resistance to threats. 8

- B) Explain how the access matrix can be implemented effectively. 8