Nov - Dec
2010

[3863] – 451

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**

P.T.O.

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

6

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**