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Paper Code : PCC-CS502 Operating Systems

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following : [1 x 10 = 10]

(I) The _____ must design and program the overlay structure.

(II) If one or more devices use a common set of wires to communicate with the computer system, the connection is called _____

(III) ____ systems have more than one CPU in close communication with the others.

(IV) FIFO scheduling is _____

(V) A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which access takes place is called _____

(VI) A solution to the problem of external fragmentation is _____

(VII) _____ will happen if a non-recursive mutex is locked more than once?

(VIII) Each entry in a translation lookaside buffer (TLB) consists of _____

(IX) On systems where there are multiple operating system, the decision to load a particular one is done by _____

(X) Trap is a _____

(XI) _____ are the operations that can be invoked on a condition variable

(XII) Under multiprogramming, turnaround time for short jobs is usually _____ and that for long jobs is slightly _____

Group-B (Short Answer Type Question)

Answer any three of the following [5 x 3 = 15]

2. What is a process? With the help of a diagram, explain the different process states. [5]
3. Explain with example pre-emptive and non pre-emptive scheduling algorithms [5]
4. What is spooling? Compare SJF and SRTF. [5]
5. Prove Dekker-Peterson's solution ensures mutual exclusion. [5]
6. Is segmentation possible without paging? Justify your answer. [5]

Group-C (Long Answer Type Question)

Answer any three of the following [15 x 3 = 45]

7. Explain multi level feedback scheduling. List the different criteria for scheduling algorithms. [5+5+5]
For the processes listed in the table, calculate the average turn around time and average waiting time, for RR (quantum=2) and SRTF.

Process	Arrival Time	Burst Time
P1	0	3
P2	1	6
P3	4	4
P4	6	2

8. List down the methods of deadlock detection and deadlock avoidance. Explain how deadlock can be recovered through deadlock. What is livelock? [4+4+4+3]
9. Make a comparative analysis of the various scheduling algorithms, How does synchronization and scheduling go hand in hand? [8+7]
10. Define critical Section. Mention the mechanism to control access to critical section.Explain how use of monitors guarantees mutual exclusion. [3+4+8]

11. Discuss about shell and kernel. Explain the process of booting. Explain forking. Discuss about orphan, zombie and daemon process. [4+2+3+6]

*** END OF PAPER ***