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Paper Code : PCC- CS502/PCC-CS502/PCCCS502/PCCCSD503 Operating Systems

UPID : 005507

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 strategy of making processes that are logically runnable to be temporarily suspended is called _____.

(II) An un-interruptible unit is known as _____.

(III) The _____ swaps processes in and out of the memory.

(IV) The hardware mechanism that allows a device to notify the CPU is called _____.

(V) Operating system acts and _____between user and hardware.

(VI) _____ algorithms tends to minimize the process flow time.

(VII) The bounded buffer problem is also known as _____.

(VIII) Every address generated by the CPU is divided into two parts. They are _____.

(IX) If the block of free-space list is free then bit will _____.

(X) _____operating system that reads and reacts in terms of actual time.

(XI) A process to be executed is selected from the _____ queue by the _____ scheduler.

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

Group-B (Short Answer Type Question)

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

2. Explain semaphores with example. [5]
3. Explain different types of schedulers. [5]
4. Mention the conditions for achieving mutual exclusion. [5]
5. Explain logical and physical address space. Give mathematical example to show the mapping. [5]
6. Why does an operating system require dual-mode and multi-mode operations? [5]

Group-C (Long Answer Type Question)

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

7. Differentiate between thread and process. Explain the need for PCB. What is context switching? What happens if time quantum is too small or too large in case RR scheduling? [4+3+2+6]
8. What are files and directories? With suitable diagram explain linked file allocation and inodes . [5+10]
9. Compare external and internal fragmentation. What is burping? [4+3+8]

Consider the memory Fragment at any instant of time:

Additional requests for 20K, 10K and 5K are received in this order. At what starting address will these requests be allocated using First Fit, Best Fit and Worst Fit algorithms?

Used	Hole	Used	Hole	Used	Hole	Used	Hole	Used	Hole	Used	Hole
10K	10K	20K	30K	10K	5K	30K	20K	10K	15K	20K	20K

10. Consider the track requests in the disk queue (23,, 89,, 132,, 42,, 187), head starts at position 100. Explain and compute the total head movement using the following disk scheduling algorithms : (i) SSTF (ii) C-SCAN (iii) Look (iv) CLOOK (v) FCFS [3+3+3+3+3]
11. On a system using Round Robin Scheduling, let s represent the time required to perform a process switch, q represent the RR time quantum, and r represent the average time a process runs before blocking on I/O. Compute formula for CPU efficiency given the following: [3+3+3+3+3]
i) q=∞ ii) q>r iii) s<q<r iv) s=q<r v) q nearly 0

*** END OF PAPER ***