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Paper Code : MCAN-202 Operating System

UPID : 002519

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 x 10 = 10]

1. Answer any ten of the following :
   (i) What are the components of operating system?
   (ii) What is the function of Program Counter in PCB?
   (iii) What is swapping?
   (iv) What are types of accessing a file?
   (v) What is seek time?
   (vi) What is an Operating System?
   (vii) What are frames?
   (viii) What is busy-waiting?
   (ix) What is rotational latency?
   (x) Write main advantages of multiprogramming.
   (xi) What is dispatch latency?
   (xii) What do you mean by page fault?

Group-B (Short Answer Type Question)

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

2. Explain process states with a suitable diagram. [5]
3. Explain FCFS disk scheduling with a suitable example. [5]
4. What is the most important system program and why? [5]
5. A page takes 20 ns time to search in TLB and 100 ns to access memory. If page is not found in TLB first access the memory 100 ns. Hit ratio is 80%. Then find the effective memory access time? [5]
6. Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB and 600 KB (in order). How would each of the first fit, best fit, worst fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? Which algorithm makes the most efficient use of memory? [5]

Group-C (Long Answer Type Question)

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

7. (a) Explain how CPU switches process to process with a suitable diagram. [6]
   (b) Define process contention scope and system contention scope. [4]
   (c) Write the benefits of threads. [5]
8. Suppose that a disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order is 86, 47, 93, 174, 98, 150, 102, 170, 130. Starting from the current head position what is the total distance that the disk arm moves to satisfy all the pending requests for the following disk scheduling algorithms? [5+5+5]
   i) FCFS
   ii) SSTF
   iii)SCAN
9. Explain Directory Structures [15]
10. (a) Explain paging with TLB with a suitable diagram. [12]
    (b) What is the disadvantage of using TLB? [3]
11. Find page fault and also determine which algorithm is best suited from the following reference string: [5+5+5]
    7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
    with 3 frames using the following algorithms:

i) FIFO
ii) LRU
iii) Optimal

*** END OF PAPER ***