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Paper Code : BCAC302 Operating System

UPID : 300069

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) A single thread of control allows the process to perform _____.

(II) The interval from the time of submission of a process to the time of completion is termed as _____.

(III) Semaphore is a/an _____ to solve the critical section problem.

(IV) For a deadlock to arise, which conditions must hold simultaneously?

(V) What is an operating system?

(VI) What is a Process Control Block?

(VII) The segment of code in which the process may change common variables, update tables, write into files is known as _____.

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

(IX) Each entry in a segment table has a _____.

(X) Swap space exists in _____.

(XI) What happens if working set window is too small?

(XII) Consider the following page reference string:
1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6
For FIFO page replacement algorithms with 3 frames, what is the number of page fault?

Group-B (Short Answer Type Question)

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

2. What are the different states of a process? [5]

3. (a)What is virtual memory? [5]
(b)What is thrashing?

4. What is Belady's Anomaly? [5]

5. What is starvation? Explain aging in Operating System. [5]

6. What are the differences between Real Time System and Timesharing System? [5]

Group-C (Long Answer Type Question)

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

7. (a) What is fragmentation? Discuss different types of fragmentation. [5]
(b) Write down the advantages and disadvantages of Paging. [5]
(c) What is Segmentation? [5]

8. (a) Explain thread. Write down the advantages of thread. [5]
(b) Write down the differences between a process and a thread. [5]
(c) Explain different thread models. [5]

9. (a) Explain Peterson's algorithm. Discuss the merits and demerits of this. [6]
(b) Discuss 'Readers - Writers' problem with the help of semaphores. [3]
(c) The address sequence generated by tracing a particular program executing in a pure demand paging system with 100 bytes per page is: [6]
0100, 0200, 0430,0499, 0510, 0530, 0560, 0120, 0220, 0240, 0260, 0320, 0410
Suppose that the memory can store only one page at a time and if X is the address which causes a page fault then from address X to X+99 are loaded onto the memory. How many page faults will occur?

10. (a) Write and explain the logic of 'Bully algorithm' in a distributed system. [5]

(b) Briefly describe the common failures in distributed system. [5]

(c) What are the necessary conditions for deadlock? [5]

11. (a) Explain resource allocation graph for deadlock avoidance. [5]

(b) Discuss different deadlock recovery techniques. [5]

(c) Describe system model for deadlock. [5]

*** END OF PAPER ***