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BCA IIIrd Semester Examination, 2023

OPERATING SYSTEM

Paper : BCA-303

Time : 3 Hours]   [M.M. : 70

Note : Answer any five questions. All questions carry equal marks.

1. (a) What are files and explain the access methods for files ?

   (b) Write short notes on the following :

      (i) File system protection and security

      (ii) Linked file allocation methods

2. Consider the following process :

Process Id	Arrival Time	Execution Time
A	0	4
B	2	7
C	3	3
D	3.5	3
E	4	5

What is the average waiting and turn around time for these process with ?

   (i) FCFS Scheduling

   (ii) Preemptive SJF Scheduling

3. **What is Paging ?** Describe how logical address is translated to physical address in a paged system. Further give reasons as to why page sizes are always kept in powers of 2.

4. Illustrate the page-replacement algorithms :

   (i) FIFO

   (ii) Optimal Page Replacement

   use the reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 for a memory with three frames.

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5. (a) What is Real Time Operating System ? What is the difference between Hard real time and Soft real time operating system ?

(b) Define the services provided by the Operating System.

6. (a) Draw and explain the Process State Transition diagram.

(b) Write and explain Banker's algorithm for avoidance of deadlock.

7. Obtain the total number of head movements needed to satisfy the following *sequence of track* requests for C-LOOK and S-SCAN policies : 27, 129, 110, 186, 147, 41, 10, 64, 120. Assume that the disk head is initially positioned over track 100 and is moving in the direction of decreasing track number.

8. (a) Describe the typical elements of the process control block.

(b) What are the various scheduling criteria for CPU scheduling ?

(c) What is the main function of the memory-management unit ?

(d) Define seek time and latency time.

(e) Differentiate between process and thread.

(f) What is a safe state and an unsafe state ?

(g) Explain the logical address space and physical address space diagrammatically.

9. Explain the conditions of deadlock detection techniques and explain RAG.

10. (a) List the essential requirements of Critical Section Implementation.

(b) Explain the difference between external fragmentation and Internal fragmentation. How to solve the fragmentation problem using paging ?