Code : 105314

2013 (A)

OPERATING SYSTEMS

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

*(ii) There are **TEN** questions in this paper.*

*(iii) Attempt any **FIVE** questions.*

1. *(a)* Define operating system. What are the duties performed by an operating system?

(b) What are the main advantages of time sharing systems?

(c) What are system calls? Explain their importance. 6+4+4

2. *(a)* Differentiate between a file and a Directory. Justify for the need of file system.

(b) Explain the main features of general graph directory structure. 7+7

3. *(a)* What do you understand by deadlock? Discuss the methods to avoid deadlock in an operating system.

(b) Explain the working of resource allocation graph. 8+6

4. *(a)* What is the difference between physical and logical address space?

(b) What are semaphores? How can they be used to handle the process synchronization problem? 6+8

5. *(a)* What are the benefits of segmentation?

(b) Explain the segmentation techniqu- with the help of a diagram. +10

6. *(a)* Explain the following terms :

(i) Turnaround time

(ii) Waiting time

(iii) Response time

(iv) Throughput

(b) Consider the following page replacement string :

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0,1, 7, 0, 1

Find the number of page faults using the following algorithms for a memory of three frames :

(i) FIFO algorithm

(ii) LRU algorithm 4+10

7. (a) What do you understand by fragmentation? Explain the difference between external and internal fragmentations.

   (b) What is a thread? Explain the benefits of using threads. 7+7

8. (a) What do you understand by address binding? Explain the various address binding schemes.

   (b) Explain the importance of virtual memory. 8+6

9. (a) What do you understand by disk scheduling? Describe seek time and rotational latency.

   (b) Describe SCAN scheduling. How is C-SCAN different from SCAN? 6+8

10. Write short notes on (any *three*) : 14

   (a) Micro kernel

   (b) Bankers Algorithm

   (c) Process control block

   (d) Paging

   (e) Indexed allocation

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