Roll No. ..... Total Pages : 04

BT-5/D-14 **8504**

OPERATING SYSTEMS

CSE-307

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Give the difference between multi-programming and multiprocessing. 4

   (b) Differentiate between pre-emptive and non-pre-emptive scheduling. 4

   (c) Explain file access and allocation methods. 4

   (d) Write a short note on interrupt mechanisms. 3

2. (a) Describe the following CPU scheduling algorithms with the help of suitable examples : 12

   (i) FCFS

   (ii) SJF

   (iii) RR.

   (b) Write a short note on threading. 3

Unit II

3. (a) Given memory partitions of 100k, 500k, 200k, 300k and 600k (in order), apply first fit and best fit algorithms to place processes with the space requirement of 212k, 417k, 112k and 426k (in order) ? Which algorithm makes the most effective use of memory ? 7

   (b) Define the term 'thrashing'. What are the factors causing it ? Explain. 5

   (c) Differentiate between paging and segmentation. http://www.kuonline.in 3

4. (a) Explain the following page replacement algorithms with the help of suitable examples : 12

   (i) LRU replacement

   (ii) FIFO replacement

   (iii) Optimal replacement.

   (b) Write a short note on device scheduling. 3

Unit III

5. (a) What are the four necesary conditions of deadlock prevention ? Explain with the help of suitable examples. 7

   (b) Suppose there are 2 copies of resource A, 3 copies of resource B, and 3 copies of resource C. Suppose further that process 1 holds one unit of resources B and C and is waiting for a unit of A; that process 2 is holding a unit of A and waiting on a unit of B; and that process 3 is holding one unit of A, two units of B, and one unit of C. Draw the resource allocation graph. Is the system in a deadlocked state ? Why *or* why not ? 8

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6. (a) What are Semaphores ? How do they implement mutual exclusion ? 7

   (b) What is a race condition ? Explain how does a critical section avoid this condition. What are the properties which a data item should possess to implement a critical section ? 8

Unit IV

7. Write short notes on the following terms with reference to DOS : 15

   (i) Device Management

   (ii) Interrupt Mechanism.

8. Explain the following terms with reference to UNIX : 15

   (i) File System

   (ii) Concurrency control.

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