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Printed Pages : 3

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BT-4 / M-19

OPERATING SYSTEMS

Paper–CSE-210 N

Time allowed : 3 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) How the parallel and distributed computing environments are implemented by the operating systems ? 7½

(b) Why it is always beneficial to use various types of protection by the operating systems ? 7½

2. (a) Explain and justify the roles of the following :

(i) Multiprogramming 3

(ii) Time sharing 3

(iii) Multithreading 3

(b) Discuss the technical modus operandi of using virtual machines and system calls. 6

Unit–II

3. (a) Define thread. What are the benefits of threads ? Explain the scientific differences of using users and kernel threads. 7½

(b) What is the basic role of using process synchronization ? Explain the basic taxonomy of using binary semaphores and queue semaphores. 7½

4. (a) Draw and explain the flow of process management activity that takes place during co-operating processes and inter process communication. 5

(b) What do you mean by mutual exclusion ? Explain Dekker's solution for mutual solution. 5

(c) Define process scheduling. Differentiate between preemptive and non-preemptive scheduling. 5

Unit–III

5. (a) Define paging with the help of a schematic diagram. Explain the principles which are involved in the operation of paging. Also, discuss about the hardware support for paging. 7½

(b) Explain the Dual-mode operation of an operating system. Explain contiguous memory allocation and linked allocation methods with the help of suitable working diagram. 7½

6. (a) Explain the concept of thrashing. What are the two available techniques to prevent thrashing ? Explain them in detail. 7½

(b) What is fragmentation ? What is the need of fragmentation? Explain the difference between internal and external fragmentation. 7½

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Unit–IV

7. (a) Draw the Gantt chart for the SSTF and FCFS scheduling policies and calculate the turnaround time, average turnaround time, waiting time, average waiting time, throughput and processor utilization for the following set of processes that arrive at a given arrival time shown in the table by applying SSTF and FCFS. 12

Process	Arrival Time	Processing Time (Milliseconds)
P1	0	2
P2	1	4
P3	2	5
P4	4	1
P5	5	6
P6	6	2

(b) Briefly explain the method of chaining for disk space management. 3

8. (a) Explain file free space management approaches. Write the role of sector sparing in identifying the bad blocks of mass storage. How different resources are assigned during free space management. 7½

(b) Write about monolithic kernel, layered and microkernel structures of UNIX file system. 7½