

1078
B.E. (Computer Science and Engineering)
Fifth Semester
CSE-511: Operating System

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- a) What are system calls?
- b) What are real time systems?
- c) List different ways for inter process communication.
- d) How waiting time of a process is calculated?
- e) What is the purpose of medium term scheduler?
- f) Can logical address space be larger than physical address space?
- g) What is thrashing?
- h) What is swap space?
- i) What are boot blocks?
- j) List any two popular file systems. (10x1)

UNIT - I

- II. a) Describe the purpose of an operating system. Differentiate between batch systems, multi-programmed, multi tasking and multi processing systems.
b) Explain the process state transition diagram. What is the main information contained in the process control block? (5,5)
- III. a) Consider four processes, all arriving at time zero, with total execution time of 10, 20, 30 and 40 units, respectively. Each process spends the first 20% of execution time doing I/O, the next 70% of time doing computation, and the last 10% of time doing I/O again. The operating system schedules a new process either when the running process gets blocked on I/O or when the running process finishes its compute burst. Assume that all I/O operations can be overlapped as much as possible. Compare the percentage of time CPU remains idle in shortest remaining time first scheduling and longest remaining time first?
b) What are binary semaphores? Explain their implementation? (6,4)

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- (2) (5,5)
- IV. a) What is Demand Paging? How the performance of demand paging is measured?
b) What is the difference between segmentation and paging? Explain the different structures of page tables. In a machine with 128 MB RAM with 24-bit logical address space- what is the size of the page table, if the page size is 2KB?
c) What is critical section? (4,4,2)

UNIT - II

- V. a) Compare the performance in terms of storage efficiency and access time for different disk space allocation method.
b) What are the virtual file systems? Explain the file structure and various free space management techniques. (5,5)
- VI. a) What are the different disk scheduling algorithms? Highlight their differences using a suitable example.
b) Explain the different ways to detect the deadlock and then recover from it. (5,5)
- VII. a) Explain the Unix File System? How INODES are assigned?
b) How file management of different OS differs? Analyze the different file management strategies. (4,6)

x-x-x