

University of Mumbai

S.E Second Year 2013 - 2014 May

Semester 4 (SE Second Year)

Operating Systems

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(OLD COURSE)
(3 Hours)

QP Code : MV-18984
[Total Marks : 100

Instruction:-

1. Write Five Questions Only
2. Question 1 is compulsory.
3. Each question carry equal marks and sub-question marks are equally divided.

Q1. Answer in Brief (ANY FIVE)

- I. What are the two major functions of Operating System?
- II. What is the difference between Timesharing & Multi-Programming OS?
- III. What is the purpose of System Call in OS?
- IV. What are block special and character special files?
- V. What is Kernel mode of OS?
- VI. What are Shell and Shell Script?

Q2.

- a) Draw schematic of Process State Diagram and explain each state transition.
- b) Contrast the difference between process and thread.

Q3.

- a) What are the problems associated with critical region? How to overcome the problems using semaphores?
- b) Explain scheduling strategy smallest job first and its advantages.

Q4.

- a) Assume that main memory can have 4 page frames max. Initially all are empty. Consider a sequence of 8 page size program pages loaded in the memory as follows 0,1,7,2,3,2,7,1,0,3. Draw table showing the main 4 page frame status after each page loaded. How many page faults are expected at the end of last page loaded in the memory using LRU page replacement strategy?
- b) Explain Index allocation of disk blocks with a neat diagram. What is the maximum and minimum size of file stored if block size is 1Kbytes each? Assume that disk address is 8 bytes, i-node has 10 direct entries and one single, double and triple entries.

Q5.

- a) Explain the deadlock management techniques namely Detection, Prevention, Avoidance. What is a integrated deadlock strategy?
- b) Explain Elevator Algorithm and find seek time if disk cylinder request are in the following order 10, 22, 20, 2, 40, 6, 38. Assume disk takes 6ms per cylinder move and initial cylinder is 20.

Q6.

- a) Explain Dining Philosopher problem and give the most suitable solution to it.
- b) Write a Unix Shell Script to read a file of integers and append the file with an integer equal to last integer + 1.

Q7. Write Short Notes (ANY TWO)

- a) Segmented Paging Memory Management.
- b) Process Control Block and Process Switching.
- c) Use of Monitors for mutual exclusion.
- d) RAID or File system Journaling.