

**Operating System
(CSE-202, Dec-2005)**

Note: Section A is compulsory. Attempt any four questions from Section-B and any two from Section-C.

Section-A

1. a) In a multi-programming and time sharing system several users share the system simultaneously. What are the various security problems here? Can we have the same degree of security as in a dedicated machine?
- b) Define preemptive and non preemptive scheduling state. Why strict non-preemptive scheduling is unlikely to be used in a computer centre?
- c) Define virtual memory.
- d) Is it possible to have a deadlock involving only one process? Explain your answer.
- e) What are the different objectives for the operating system to decide scheduling?
- f) Why the page size is always in powers of 2?
- g) What is fragmentation? What are its different types?
- h) Differentiate between protection and security.
- i) What is the function of PCB?
- j) What is reentrant code? What is better to share a reentrant code out of paging and segmentation?

Section-B

2. What is an OS? Discuss in detail how the OS can be classified into different categories.
3. What is thrashing? How does the system detect thrashing? What can the system do to eliminate the problem?
4. Consider the following set of processes with the length of CPU burst time given in milliseconds:

PROCESS	BURST TIME	PRIORITY
P1	10	3
P2	2	3
P3	1	1
P4	5	2
P5	4	4

The processes are assumed to be arrived in order P1, P2, P3, P4, P5. Explain

- (i) FCFS (ii) SJF (iii) RR (iv) Priority scheduling.

Take a time quantum of 1.

5. Consider a main memory with capacity of 4 page frames. Assume that the pages of a process are referenced in the order as given below:

1, 3, 4, 4, 3, 2, 1, 7, 5, 6, 4, 2, 1, 2

6. Explain multiprocessor and distributed operating systems with their merits and demerits.

Section-C

7. Explain how UNIX has a better policy to handle smaller files than the larger files? Explain how UNIX is booted. Show inode structure in UNIX.
8. (a) Give an example of producer-consumer problem, indicating the reasons for inconsistency that can arise due to race conditions.
(b) Explain how a deadlock can be represented graphically for two processes and two resources. Discuss the merits/demerits of two ways in which the operating system can recover from a deadlock.
9. (a) Explain different paging techniques. Why paging is combined with segmentation?
(b) Write short notes on:
 - (i) LINUX operating system
 - (ii) Semaphores