

(REVISED COURSE)

(3 Hours)

[Total Marks : 100

- N.B. (1) Question No. 1 is compulsory.
(2) Solve any four questions from remaining questions.

1. (a) Explain Operating System as an extended machine while explaining its seven functions. 10
(b) Define the following terms :— 10
(i) Multiprogramming operating system.
(ii) Process control block.
(iii) Critical region.
(iv) Virtual memory.

2. (a) Give events which may cause a process to change its state— 10
from new to ready
from ready to running
from running to blocked etc.

- (b) Consider following snapshots of a system. There are no current outstanding queued unsatisfied requests :— 10

	r_1	r_2	r_3	r_4								
Available	2	1	0	0								
					Current allocation	Maximum demand	Still needs					
P_1	0	0	1	2	0	0	1	2				
P_2	2	0	0	0	2	7	5	0				
P_3	0	0	3	4	6	6	5	6				
P_4	2	3	5	4	4	3	5	6				
P_5	0	3	3	2	0	6	5	2				
	r_1	r_2	r_3	r_4	r_1	r_2	r_3	r_4	r_1	r_2	r_3	r_4

- (i) Compute "Still needs" matrix.
(ii) Is the system currently safe or unsafe ? Why ?
(iii) Is this system currently deadlocked ? Why or why not ?
(iv) Which process, if any, may be deadlocked ?

3. (a) Explain Unix Concurrency Control method. 10
(b) What is meant by pre-empting a process ? What is swapping and what is its purpose ? 10
4. (a) Explain monitors used for mutual exclusion along with its structure and signals. 10
(b) Explain the scheduling criteria that we consider while choosing a scheduling algorithm. 10
5. (a) Explain data structure used for paging system. How are page tables managed by the operating system ? 10
(b) List and explain in brief various Memory Management Techniques. 10
6. (a) Explain various IO buffering techniques. 10
(b) What is NTFS ? How Windows 2000 uses NTFS ? 10
7. Write a short notes on any two :— 20
(a) File organisation and access
(b) Operating system design issues
(c) Threads
(d) Fair-Share scheduler.