(Pages : 3)   **B – 3359**

Reg. No. : ....

Name : ....

Fifth Semester B.Tech. Degree Examination, December 2016
(2013 Scheme)
13.503 : OPERATING SYSTEMS (FR)

Time : 3 Hours   Max. Marks : 100

PART – A

Answer **all** questions :   **(5×4=20 Marks)**

1. Discuss the different types of operating systems.

2. Discuss time-sharing and real-time operating systems. Give an examples for each.

3. Discuss the various methods of interprocess communication.

4. Compare logical and physical address space. How is the logical address relocated to physical address ?

5. What are the necessary conditions for a deadlock to occur ?

PART – B

Answer **any one** question from **each** Module.   **(4×20=80 Marks)**

Module – I

6. a) Draw the architecture of an operating system and explain the function of each part.

   b) Explain all attributes and all operations performed on a file.

OR

7. a) Explain sequential and direct access of files.

   b) Explain the Tree structured directory structure with a diagram. What are its advantages ?

P.T.O.

Module – II

8. a) Explain the critical section problem. What are the requirements to solve the problem ?

   b) Explain the FCFS and SJF scheduling algorithms. Make a comparison of the two.

OR

9. Consider the following set of processes :

Process	Arrival Time (ms)	Next Burst (ms)	Priority
P0	0	24	4
P1	3	7	3
P2	5	6	2
P3	10	10	1

Time slice for RR = 4 ms

For the FCFS, SJF, Priority based Non-preemptive and RR algorithms :

   a) Draw Gantt charts.

   b) Calculate average turn around time.

   c) Calculate average waiting time.

Module – III

10. a) Explain the memory management scheme called 'paging'. Draw the paging hardware.

   b) Explain what you mean by internal and external fragmentation.

OR

11. Consider the following page reference string :

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

   How many page faults will occur for the following page replacement algorithms ? Assume a set of three page frames. (Initially all empty)

   a) FIFO

   b) LRU

   c) Optimal.

Module – IV

12. Consider the following snapshot of a system.

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P1	0	0	1	2	0	0	1	2	2	1	0	0
P2	2	0	0	0	2	7	5	0				
P3	0	0	3	4	6	6	5	6				
P4	2	3	5	4	4	3	5	6				
P5	0	3	3	2	0	6	5	2				

    i) Compute NEED matrix.

    ii) Is the system in safe state ? Justify answer.

    iii) Is the system dead-locked ? Justify answer.

    iv) Can a request (0, 1, 0, 0) from P3 be safely granted immediately ? Justify the answer.

OR

13. a) How is a deadlock avoided using Resource Allocation Graph ?

    b) What are the different ways of implementing 'access matrix' ?