FIFTH SEMESTER B.TECH DEGREE EXAMINATION NOVEMBER 2015

MODEL QUESTION PAPER

13.503 OPERATING SYSTEMS (FR)

Time: 3Hrs **Max Marks: 100**

PART A

Answer all Questions (5 x 4 =20)

1. Discuss the various Operating System Services.
2. Why it is important for a scheduler to distinguish I/O bound programs from CPU bound programs?
3. Discuss about the address translation method used in paging with example
4. How is deadlock detection done?
5. Discuss the solution to dining philosopher's problem using Semaphores.

PART B

Answer any one Question from each module (4 x 20=80)

Module I

6. a) Discuss about the different components of the Operating Systems

   b) Explain the different types of directory structures.

OR

7 a) Explain the different file allocation policies.

b) Differentiate batch processing systems and multi processing systems

Module II

8. Consider following set of process with length of the CPU burst given in milliseconds

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1,P2,P3,P4,P5 all at time 0.

a) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithm: FCFS, SJF, non Preemptive priority and RR.

b) What is the turnaround time of each process for each of the scheduling algorithms in part a?

c) What is the waiting time of each process for each of the scheduling algorithm in part a?

d) Which of the algorithms in part a results in minimum average waiting time over all processes?

OR

9 a) Discuss the various modes used for inter process communication.

b) How can the critical section problem be solved using Semaphores

Module III

10 a) With a neat diagram, explain demand paged memory allocation scheme

b)How can paging be used as an effective method to avoid external fragmentation?

OR

11. Suppose a disk drive has 5000 cylinders numbered from 0 to 4999. The drive is currently serving a request at cylinder 125. The queue of pending request in FIFO order is 86, 1470, 913, 1774,948,1509,1022,1750,130

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms

a)FCFS b)SSTF c)SCAN d)LOOK e) C-SCAN f)C-LOOK

Module IV

12. Consider the following snap shot of a system

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	3	6				

Answer the following questions using Bankers algorithm

a) What is the content of the matrix Need?
b) Is the system in a safe state? If yes what is the safe sequence?
c) If a request from process P1 arrives for (0, 4,2,0) , can the request be granted immediately?

OR

13. a) How can access matrix be viewed as model for protection in an operating system.

b) What are the different ways of implementing the access matrix.