Reg. No. : ....

Name : ....

Fifth Semester B.Tech. Degree Examination, December 2015
13.503 : OPERATING SYSTEMS (FR)
(2013 Scheme)

Time : 3 Hours   Max. Marks : 100

PART – A

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

1. Difference between Multiprocessing and Multiprogramming.

2. Difference between preemptive and non-preemptive scheduling.

3. What is Fragmentation ? What are its types ? Explain any one.

4. What are the requirements that a solution to the critical section problem must satisfy ?

5. Explain Race condition with an example.

PART – B

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

Module – I

6. a) What is distributed Operating system ? Write a brief notes on any five Operating Systems services.

   b) What is time-sharing operating system ? Write its advantages and disadvantages.

OR

7. a) What are the types of operating system ? Explain any two in detail.

   b) Explain single level directory and two level directory in detail.

P.T.O.

Module – II

8. a) What are the goals of good scheduling algorithm ? Explain preemptive and non-preemptive scheduling using a simple example.

   b) What is critical section problem ? Explain two process solutions and multiple process solutions.

   OR

9. a) Consider the following set of process with length of the CPU burst given in seconds :

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4

   Assume quantum time for RR is 2 seconds.

   i) Draw Grant charts for each of the following scheduling algorithm : FCFS, preemptive SJF, non-preemptive SJF and RR.

   ii) What is the average turnaround time for each of the scheduling algorithms ?

   iii) What is the total waiting time for each of the scheduling algorithms ?

   iv) Which one is an optimal algorithm in terms of average waiting time ?

   b) What is CPU scheduling ? Explain Multilevel Feedback-Queue scheduling in detail.

Module – III

10. a) What is Thrashing ? Explain the method to avoid thrashing.

    b) What is Demand paging and what is its use ?

    OR

11. a) Discuss with diagrams the following three disk scheduling :

    FCFS, SSTF, C-SCAN.

b) 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 would occur for the following replacement algorithms, assuming three frames ?

Remember that all frames are initially empty, so your first unique pages will all cost one fault each :

1) LRU replacement
2) FIFO replacement
3) Optimal replacement.

Module – IV

12. a) Explain about deadlock prevention and deadlock avoidance algorithms.

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

OR

13. Consider the table given below for 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 Banker's algorithm ?

a) What is the content if Need matrix ?

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, 1, 2), can the request be granted immediately ?