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A – 6540

Reg. No. :

Name :

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

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

(5×4=20 Marks)

1. What are the three main purposes of an operating system ? Differentiate between operating systems for mainframe computers and personal computers.
2. Discuss different types of scheduling. Explain the difference between preemptive and non-preemptive scheduling.
3. Explain the hardware address protection with base limit registers in segmentation.
4. What are the different ways of implementing access matrix ?
5. Explain the features that characterize deadlock.



PART – B

Answer **any one** question from **each** Module.

(4×20=80 Marks)

Module – I

6. a) Distinguish between client server and peer-to-peer model of the distributed systems.
b) Explain the different types of file allocation systems.

OR

7. a) Explain the different types of operating systems with example.
b) Explain the file system directory structure.

P.T.O.



Module - II

8. a) Assume you have the following jobs to execute with one processor, with the jobs arriving in the order listed in Table Q. 8 a.

Process No.	Execution Time	Arrival Time
0	80	0
1	20	10
2	10	10
3	20	80
4	50	85

Table Q. 8a

- i) Suppose a system uses Round Robin scheduling with a quantum of 15. Create a Gantt chart illustrating the execution of these processes.
 - ii) What is the turnaround time for Process No. 3 ?
 - iii) What is the average wait time for the processes ?
- b) Explain multilevel feedback queue scheduling. What advantages is there in having different quantum sizes on different levels in multilevel queueing system ?
- c) What scheduling policy will you use for each of the following cases ? Explain your reasons for choosing them.
- i) The processes arrive at large time intervals.
 - ii) The system's efficiency is measured by the percentage of jobs completed.

OR

9. a) Explain Reader Writers problem. Write an algorithm to solve this using semaphore.
- b) Explain critical regions and conditional critical regions. What is the use of a scheduler in an operating system ?

Module - III

10. 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 one, two, three, four, five, six and seven frames ? Remember that all frames are initially empty, so your first unique pages will cost one fault each.
- i) LRU replacement
 - ii) FIFO replacement
 - iii) Optimal replacement.

OR



- 11. a) What is segmentation ? With a neat diagram explain the segmentation hardware used in address translation.
- b) With the help of an example, explain C-SCAN AND SSF disk scheduling algorithm.

Module - IV

- 12. a) Explain the different variants of COPY rights in an access matrix. Discuss the strengths and weaknesses of implementing an access matrix using access lists that are associated with objects.
- b) Discuss various methods of handling deadlocks.

OR

- 13. a) Resource type A has 12 instances, resource type B has 4 instances and resource type C has 6 instances. Consider the following snapshot shown in Table 13 a. If process P3 makes a request of (2, 1, 0) will the system be safe ? Show all steps.

	Allocation			Max		
	A	B	C	A	B	C
P0	2	1	0	9	4	2
P1	2	0	0	3	2	2
P2	3	0	1	9	0	2
P3	2	1	1	4	2	2
P4	0	0	2	4	3	3



Table 13 a

- b) Write a deadlock free solution to the dining philosophers problem using monitors.
