



Code No: 812AG

R13**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****MCA II Semester Examinations, June/July - 2018****OPERATING SYSTEMS****Time: 3 Hours****Max. Marks: 60****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 8 marks and may have a, b, c as sub questions.

PART - A**5 × 4 Marks = 20**

- 1.a) What are the advantages and disadvantages of Batch processing systems? [4]
- b) Write down the differences between a semaphore and a monitor. [4]
- c) Explain briefly about demand paging. [4]
- d) Discuss the objectives for a file management system. [4]
- e) Explain briefly about the four conditions of a deadlock situation. [4]

PART - B**5 × 8 Marks = 40**

- 2.a) Compare and Contrast client-server and peer-to-peer models of a distributed system.
- b) Explain the services provided by an operating system from user-perspective. [4+4]

OR

3. What is a virtual machine? Explain the concept and working principle of a virtual machine. [8]
4. Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Priority
P1	20	3
P2	26	1
P3	02	4
P4	19	1
P5	16	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. Draw the Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, SRTF and Priority. Also determine the average waiting time and average turnaround time for each of the algorithms. [8]

OR

5. What is a race condition? When it occurs in producer-consumer problem? Describe how monitors are used to solve synchronization problem. [8]





- 6.a) Define paging scheme. How is it different from segmentation?
 b) Explain paging technique along with its merits and demerits. [4+4]

OR

7. How many page faults occur for the following reference string with three page frames using FIFO, LRU and OPTIMAL page replacements algorithms? Assume that initially frames are empty.
 1,2, 3,4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2 [8]

- 8.a) Compare and contrast chained allocation with indexed allocation technique of file allocation.
 b) What is the need for mounting in a file system? [5+3]

OR

9. Explain various techniques implemented for free space management, discuss with suitable examples. [8]

10. Consider a system with five processes P0 through P4 and three resource types A, B, C. Resource type A has 10 instances, resource type B has 5 instances, and resource C has 7 instances. Suppose that, at time T0, the following snapshot of the system has been taken:

<u>Processes</u>	<u>Allocation</u>			<u>Max</u>			<u>Available</u>		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

Answer the following questions using the Banker's algorithm:

- a) What is the content of the matrix *Need*?
 b) Is the system in a safe state? [4+4]

OR

11. Explain the deadlock detection algorithm for multiple instance of resource types with an example. [8]

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