Code No: 823AA **R15**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA III Semester Examinations, October/ November - 2020
OPERATING SYSTEMS

Time: 2Hours **Max.Marks:75**

Answer any five questions
All questions carry equal marks

1.a) What is an operating system? Discuss the goals and functions of an operating system.
b) Distinguish between client-server and peer-to-peer models of a distributed system. [7+8]

2. How does a micro kernel differ from a monolithic kernel? Explain the advantages and disadvantages of system calls over library functions. [15]

3.a) What is the difference between a process, a program and a thread?
b) Explain SJF and SRTF Scheduling algorithms with an illustrative example. [7+8]

4.a) Compare preemptive and non-preemptive scheduling methods.
b) Describe how semaphore can be used for block wake up synchronization between processes. [7+8]

5. How many page faults occur for the following reference string with three and four 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 [15]

6.a) Explain about the structure of page table.
b) Explain about virtual memory. [7+8]

7. Suppose the head of a moving- head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 25. If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy these requests for the following disk scheduling algorithms: FIFO, SSTF, SCAN, LOOK. [15]

8. 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:

Processes	Allocation	Max	Available
	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? [7+8]