

Code No: 871AD

**R20**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**MCA I Semester Examinations, March - 2023**

**OPERATING SYSTEMS**

**Time: 3 Hours**

**Max.Marks:75**

**Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

- 1.a) List and explain I/O system calls. [5]
- b) Explain various scheduling criteria. [5]
- c) Explain interprocess communication through FIFO. [5]
- d) Distinguish between logical and physical address space. [5]
- e) Explain file access methods. [5]

**PART – B**

**(50 Marks)**

2. Explain time shared and real time systems in detail. [10]
- OR**
3. Describe various services provided by operating system. [10]
- 4.a) Discuss the content of process control block.
- b) Describe process state transition diagram. [5+5]
- OR**
5. Compute average waiting time for the following data using preemptive shortest job first and round robin (time quantum = 2 units) scheduling algorithm: [10]

Process ID	Arrival time	Burst time
P01	0	3
P02	2	6
P03	5	2
P04	7	7
P05	8	1
P06	9	5

6. Explain process synchronization through monitors. [10]
- OR**
7. Explain banker's algorithm for deadlock avoidance with an example system snapshot. [10]

8. Simulate LRU, MFU and LFU page replacement algorithm for following reference string considering three frames in memory: [10]  
1,2,3,4,3,4,5,5,5,6,3,6,7,6,2,4,3,1

**OR**

9. Explain memory management through paging technique and compare it with segmentation. [10]

10. Discuss various file allocation methods. [10]

**OR**

- 11.a) Explain directory structures.  
b) How does a file system provide file protection? [5+5]

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