Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

MCA (Two Years) S2 (R,S) Degree Examination May 2025

Course Code: 20MCA172

Course Name: ADVANCED OPERATING SYSTEMS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries3 marks. Marks

1		Discuss the design approaches of operating systems.	(3)
2		Explain the concept of path expressions.	(3)
3		Explain the importance of mutual exclusion in distributed systems. Illustrate the requirements for mutual exclusion.	(3)
4		Describe the implementation of access matrix model.	(3)
5		Define distributed shared memory and list the issues in implementing it.	(3)
6		Explain the components of load distributing algorithms.	(3)
7		Distinguish between UMA, NUMA & NORMA architectures.	(3)
8		Explain any two types of interconnection networks.	(3)
9		Explain the problems associated with concurrency control.	(3)
10		Describe log equivalence.	(3)

PART B

Answer any one question from each module. Each question carries 6 marks.

Module I

11	(a)	Explain critical section problem.	(3)
	(b)	Explain the operations performed on a semaphore and how they help in managing concurrent process.	(3)

OR

12		Elaborate the importance of Lamport's logical clock in distributed systems.	(6)

Module II

13	(a)	Differentiate between token based and non-token based algorithms used for mutual exclusion in distributed systems.	(2)

(b) Explain Rickart-Agarwala algorithm for mutual exclusion in distributed systems. (4)

OR

14 Explain any six design principles for secure systems. (6)

Module III

15 Explain the design issues in the design and implementation of distributed file system. (6)

OR

16 Explain any three algorithms to implement distributed shared memory. (6)

Module IV

17 Explain threads as an issue in the design of multiprocessor operating systems. (6)

OR

18 Illustrate virtualization in operating systems. Explain the advantages and disadvantages of virtualization. (6)

Module V

19 Illustrate two phase locking. Explain how does it differ from non-two phase locking mechanism. (6)

OR

20 Explain optimistic concurrency control algorithms. (6)

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