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G.R. NO.	
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PAPER CODE	U223-215(RG)
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MAY 2023 (ENDSEM) EXAM
S.Y B. TECH. (AI AND DS) (AY 2022-23 SEMESTER - II)
COURSE NAME: OPERATING SYSTEM
COURSE CODE: ADUA22205
(PATTERN 2020)

Time: [1Hr]

[Max. Marks: 30]

(*) Instructions to candidates:

- 1) Use of scientific calculator is allowed
- 2) Use suitable data where ever required
- 3) All questions are compulsory

Question No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) How would you utilize the Pthread locks to ensure mutual exclusion in a multithreaded program?	[4]	[CO3]	[Level 3 Applying]
	b) Analyze the pros and cons of using semaphores compared to locks for synchronizing concurrent programs.	[6]	[CO3]	[Level 4 Analyzing]
	OR			
	c) Compare and contrast the different types of lock primitives available in a modern operating system, such as Pthread locks and spin locks.	[6]	[CO3]	[Level 4 Analyzing]
Q.2	a) Identify and categorize the different types of storage devices that can be used in a system architecture, such as hard disk drives or solid state drives, and compare their performance characteristics.	[4]	[CO4]	[Level 4 Analyzing]
	b) Survey the different methods of device interaction, such as polling, interrupts, and DMA, and determine the advantages and disadvantages of each.	[6]	[CO4]	[Level 4 Analyzing]

	OR			
	c) Test for the effectiveness of different RAID levels in terms of data reliability and performance under various fault scenarios.	[6]	[CO4]	[Level 4 Analyzing]
Q.3	a) Use checksums to ensure data integrity and protection in a system architecture.	[4]	[CO5]	[Level 3 Applying]
	b) Analyze the performance of a computer system under different types of loads, such as CPU-bound, I/O-bound, or memory-bound, and propose strategies for optimizing the system.	[6]	[CO5]	[Level 4 Analyzing]
	OR			
	c) Analyze the different disk failure modes and their impact on data integrity and protection.	[6]	[CO5]	[Level 4 Analyzing]