



	In Sem Examination-II Summer 2024		
	Exam Seat No.:		
	Academic Year: 2023-2024	Semester: II	
	Name of Programme: MTech(VLSI and Embedded System)	Pattern: 2022	
	Name of Course: Real Time Embedded System	Course Code: ETC225107	
	Max. Marks: 30	Duration: 1 hrs	
	<b>Instructions:</b> Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.  1. This question paper contains 2 page(s). 2. Answer to each new question is to be started on a new page. 3. Assume suitable data wherever required but justify it. 4. Draw the neat, labelled diagrams, wherever necessary. 5. The last columns indicate the Course Outcome of the Question/sub-question.		

**Question No. 1 Attempt following Question.**

- a) Explain following design metrics in real-time embedded systems. (7) CO1  
a. Time to prototype b. Power c. Scalability d. Size

**OR**

- b) Difference between real-time embedded systems with non-real-time systems with examples. What is the importance of real-time embedded systems? (7) CO1
- c) Explain real-time embedded systems with block diagram. (8) CO1

**OR**

- d) Apply knowledge of embedded system design principles to evaluate the trade-offs between processor performance, power consumption, and cost in selecting an appropriate processor for a specific embedded system. (8) CO1

**Question No. 2 Attempt following Question.**

- a) Examine the role of the Memory Management Unit (MMU) in embedded systems. Discuss how MMUs manage memory resources, provide memory protection, and support virtual memory functionality. (7) CO2

**OR**

- b) Compare different type of dynamic RAM (DRAM). (7) CO2
- c) Compare features of processor cores ARM, NEC V800. (8) CO2

**OR**

- d) Compare the cache memory mapping techniques of direct mapping and associative mapping. (8) CO2  
Evaluate their respective advantages and disadvantages in terms of cache performance, complexity, and implementation in embedded systems.

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