

M. Tech. Distributed & Mobile Computing Examination, 2019
(1st year) (4th/2nd Semester)

SUBJECT: - Embedded Systems

Time: Three hours.

Full Marks: 100

| No. of Questions | Answer any five questions. | Marks |
|------------------|--|----------------------|
| 1. | a) Explain the characteristics of embedded computing applications. b) Why do we use microprocessor for designing embedded system? What are the goals of embedded computing system? c) What are the challenges in embedded computing system design? | 6 3+3 8 |
| 2. | a) How many general purpose registers are there in ARM? What is function CPSR? Explain the information that CPSR holds. b) What are the various processor modes in ARM. Explain them with example where possible. c) What is the difference between pre-index and pre-index with write back in ARM. Explain with an example. d) How is stack implemented in ARM. Explain with example. | 1+2+3 5 5 4 |
| 3. | a) What is the sufficient condition for EDF? Check whether the following tasks are schedulable using EDF on uniprocessor system. Explain your answer. $T_1(e_1=10, p_1=20)$, $T_2(e_2=5, p_2=50)$, $T_3(e_3=10, p_3=35)$. b) Explain the terms "safe", "reliable" and "critical" in context of real time embedded system with proper example. c) Explain the characteristics of Real time embedded systems. | 2+6 6 6 |
| 4. | a) Compare direct mapped and set associative mapped caching schemes with respect to memory organization. Which one is preferred for embedded system and why? b) How does MMU help in address translation? c) Differentiate between compulsory and capacity miss. | 8+1+2 5 4 |
| 5. | a) Differentiate between synchronous and asynchronous bus. b) Explain the handshake protocol. What are the disadvantages of it? c) How is peripheral to memory transfer done without DMA? What are the disadvantages of doing so? d) Explain the rotating priority scheme. | 4 3+3 4+3 3 |
| 6. | a) What is an interrupt? How is it handled? Explain the concept of introduction priority with respect to interrupt. b) Differentiate between supervisory mode, exception and trap. | 2+2+2 6 |

M. Tech. Distributed & Mobile Computing Examination, 2019(1st year) (1st/ 2nd Semester)**SUBJECT: - Embedded Systems**

Time: Three hours.

Full Marks: 100

| | | |
|----|---|-----|
| | c) What are the limitations of direct mapping scheme and how can it be overcome? | 5 |
| | d) What is the difference between spatial locality and temporal locality with respect to memory organization. | 3 |
| 7. | Write short note on : (any four) a) Basic ARM organization b) Priority Inheritance c) Peripheral to memory transfer without DMA. d) Centralized parallel arbitration e) Various compare instructions in ARM. f) Various modes of stack operations in ARM. | 5x4 |