USN ☐☐☐☐☐☐☐☐☐☐ **10CS72**

Seventh Semester B.E. Degree Examination, June/July 2015
Embedded Computing Systems

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. Define an embedded system. Explain the embedded system design process. **(12 Marks)**
   b. Define digital command control (DCC). Explain the conceptual specification of a model train controller system. **(08 Marks)**

2 a. Explain the various data operations in ARM. **(08 Marks)**
   b. Explain in detail the programming of I/O devices. **(12 Marks)**

3 a. Discuss memory interfacing and I/O interfacing in brief. **(08 Marks)**
   b. What is DMA? Explain with a neat diagram. **(06 Marks)**
   c. Explain briefly the development and debugging of an Alarm clock. **(06 Marks)**

4 a. Explain data flow and control/data flow graphs for programming models. **(08 Marks)**
   b. List and explain different program optimization techniques. **(12 Marks)**

PART – B

5 a. Explain how threads and processes are used in RTOS. **(10 Marks)**
   b. With a neat diagram, explain RTOS architecture. **(05 Marks)**
   c. Define the following: ·
      i) Task   ii) Deadlock   iii) Semaphore   iv) Schedular   v) Remote procedure call (RPC). **(05 Marks)**

6 a. Explain Inter-process communication and synchronization with signals. **(10 Marks)**
   b. List the different functional and non-functional requirements while choosing an RTOS. **(10 Marks)**

7 a. Define a distributed embedded system. Explain. **(06 Marks)**
   b. Compare I²C bus and CAN bus over their use in embedded system. **(10 Marks)**
   c. Describe the requirements for Elevator controller in brief. **(04 Marks)**

8   Write short notes on the following (5 marks each):
   a. IDE
   b. Pre-emptive scheduler
   c. Simulator and emulator
   d. Target system. **(20 Marks)**

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