Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012**

**Subject code: 170705** **Date: 28/12/2012**

**Subject Name: Embedded Technology**

**Time: 10.30 am - 01.00 pm** **Total Marks: 70**

## Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | What is the design metrics used in embedded systems? Also discuss the challenges that arise during the design process of an embedded system. | **07** |
| | **(b)** | What are the different models employed during the design process of embedded software? What is polling for events model? | **07** |
| **Q.2** | **(a)** | Discuss the case study on digital camera as an embedded system. | **07** |
| | **(b)** | What is load balancing? How is it achieved by combined partitioning? | **07** |
| | | **OR** | |
| | **(b)** | How infinite loop is used in embedded system software? What are the advantages of re-entrant function in embedded system software? | **07** |
| **Q.3** | **(a)** | What are the criteria for choosing an appropriate programming language for embedded software? What makes C language a popular choice? | **07** |
| | **(b)** | What are the features of UML? How is an anonymous object denoted in UML? | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | What is a ROM image? Explain the process of obtaining a ROM image from an assembly language program with block diagram. | **07** |
| | **(b)** | What is SoC? “SoC is a design innovation.” Justify the statement. | **07** |
| **Q.4** | **(a)** | What is an exception? How is an error handling task executed on throwing exception? | **07** |
| | **(b)** | Compare and contrast between function, ISRs and tasks. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | What is scheduling? Compare two scheduling strategies for real time scheduling – preemptive mode and round robin scheduling. | **07** |
| **Q.4** | **(b)** | Define following – [1] lock [2] Spinlock [3] TCB [4] thread [5] MUTEX [6] RPC [7] pipe | **07** |
| **Q.5** | **(a)** | What is RTOS? What are the design principles while using RTOS to design an embedded system? | **07** |
| | **(b)** | How does memory allocation differ in RTOS and OS? What is memory locking? | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | What are operating system functions at RTOS kernel? What do you mean by hierarchical RTOS? | **07** |
| | **(b)** | List three ways in which RTOS handles the ISRs in multitasking environment. What is the advantage of two-three level handling of interrupts? Explain IST. | **07** |

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