Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– V• EXAMINATION – WINTER 2016

Subject Code: 650012 Date:28/11/ 2016

Subject Name: Software Development for Embedded Systems

Time:10.30 am to 01.00 pm Total Marks: 70

Instructions:

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

Q.1 **(a)** Explain following: **07**

1. Design metric
2. Design gap
3. Market window
4. NRE cost
5. NVRAM
6. Renaissance engineer
7. CCD

(b) What is an embedded system? Why is it so hard to define? List and define the three main characteristics of embedded systems that distinguish such systems from other computing systems. **07**

Q.2 **(a)** List and define the three main processor technologies. What are the benefits of using each of the three different processor technologies? **07**

(b) Discuss the advantage and disadvantage of using memory-mapped I/O versus standard I/O. **07**

OR

(b) List and define the three main IC technologies. What are the benefits of using each of the three different IC technologies? **07**

Q.3 **(a)** Sketch the internal design of a 4 × 3 ROM. **07**

(b) The design of a particular disk drive has an NRE cost of $100,000 and a unit Cost of How much will we have to add to the cost of each product to cover $20. How much will we have to add to the cost of each product to cover our NRE Cost, assuming we sell: (a) 100 units, and (b) 10,000 units? **07**

OR

Q.3 **(a)** Compose 1Kx 8 ROMs into a 2K× 16 ROM. **07**

(b) Define what is meant by the “mythical man-month.” **07**

Q.4 **(a)** Design a 3-bit counter that counts the following sequence: 1, 2, 4, 5, 7, 1, 2, etc. This counter has an output “odd” whose value is 1 when the current count value is odd. Use the sequential design technique of the chapter. Start from a state diagram, draw the state table, minimize the logic, and draw the final circuit. **07**

(b) Explain the general purpose processor and describe why a general-purpose processor could cost less than a single-purpose processor you design yourself **07**

OR

Q.4 **(a)** Briefly define each of the following: mask-programmed PROM, EPROM, EEPROM, flash EEPROM, SRAM, DRAM, PSRAM. **07**

(b) What is Universal Asynchronous Receiver / Transmitter (UART)? Write down its basic characteristics. What are the configuration requirements before using UART **07**

Q.5 **(a)** List different laboratory tools for testing embedded system. Explain any ony in **07**

detail.

(b) Define the following terms: finite-state machines, concurrent processes, real-time systems, and real-time operating system. **07**

OR

Q.5 **(a)** Explain the assembler and cross assembler. **07**

(b) What is watchdog timer? Why it is so called? Explain its role in the design of any embedded system **07**

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