Code: CT74   **Subject: EMBEDDED SYSTEMS**

ALCCS – NEW SCHEME

Time: 3 Hours   **FEBRUARY 2013**   **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE:
- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

Q.1   a.   Summarize the major steps in the embedded system design process.

   b.   How embedded system programming is different from others? Give two examples of embedded system languages.

   c.   What is RTOS? Categorise RTOS with respective examples.

   d.   In Embedded System, why Sharing system resources requires an operating system.

   e.   Why Time –to – Market parameter is very important aspect in embedded system design?

   f.   Explain the various addressing modes in a microcontroller based embedded system.

   g.   Distinguish between CAN, IrDA and PCI protocols.   **(7×4)**

Q.2   a.   List the important characteristics of an embedded system. Compare the different types IC technologies.   **(10)**

   b.   Explain the basic design trade-off scenarios in general versus customized implementation in an embedded system.   **(8)**

Q.3   a.   Explain how design technology involves in converting concept of desired system functionality into an implementation.   **(8)**

   b.   Design a gate-level schematic for the given state diagram of figure – B.   **(10)**

Figure-B
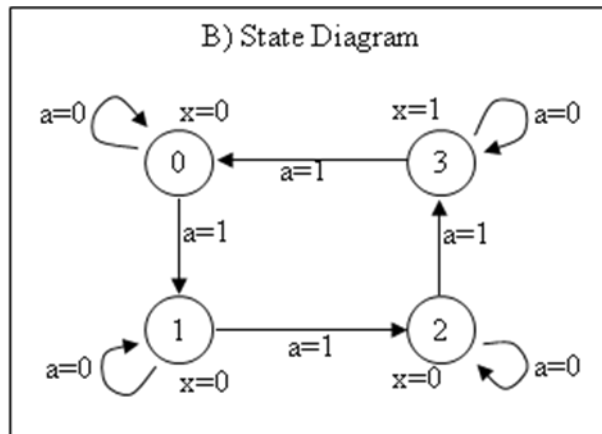
Q.4 a. Illustrate with a diagram, the interfacing of a microcontroller (any) with a temperature sensor or a light sensor. **(9)**

b. Explain Cache-replacement policy and cache write techniques. **(9)**

Q.5 a. Give an example of usage of embedded systems in multimedia applications. **(6)**

b. Draw a block diagram to interface memory (8k of data and 32k of program code) to 8051 microcontroller. Explain with timing diagram a memory read operation. **(12)**

Q.6 a. How are timers designed for an embedded system microcontroller? Explain the concept of a watchdog timer. **(10)**

b. Explain and give solution to producer consumer problem in RTOS. **(8)**

Q.7 a. Explain intellectual property cores. How are they useful and applied in an ESD? **(10)**

b. Write a short note on Emulators, Debuggers and Simulators used in ESD. **(8)**