

ALCCS – NEW SCHEME

Time: 3 Hours

AUGUST 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.

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- Q.1**
- a. Discuss the embedded system design process and briefly explain the challenges involved in embedded system.
 - b. Discuss the three methods by which an RTOS responds to a hardware source call on interrupt.
 - c. What is the function of watch dog timer?
 - d. Explain the power management techniques used in embedded system.
 - e. Enumerate the similarities and differences between the Microcontroller and Digital Signal Processor
 - f. Explain the role of embedded system in process control.
 - g. Explain various components of distributed embedded systems. (7×4)
- Q.2**
- a. What do you mean by System on chip? How will the definition of an embedded system design change with a system on chip. (9)
 - b. List and define the three main processor technologies. What are the benefits of using each of three different processor technologies? (9)
- Q.3**
- a. Explain RTOS system level functions with an example. (6)
 - b. Explain multiple task and multiple processes in embedded system. (6)
 - c. Give the applications of embedded systems for the following:
 - (i) Multimedia
 - (ii) Telecommunication (6)
- Q.4**
- a. Briefly define each of the following: mask-programmed ROM, PROM, EPROM, EEPROM, flash EEPROM, RAM, SRAM, DRAM, PSRAM and NVRAM. Discuss the worst choice memory in terms of write ability and storage performance. (10)

Code: CT74**Subject: EMBEDDED SYSTEMS**

- b. Draw the timing diagram for a bus protocol that is handshaked, nonaddressed and transfers 8 bits of data over a 4-bit data bus. (4)
- c. Explain the role of wired and wireless networks in embedded system design. (4)
- Q.5** a. Explain any six program optimization techniques used in embedded system. (6)
- b. Compare any six features of RTOS and non-RTOS (Windows, Linux etc.) (6)
- c. Explain concurrent programming features of embedded system. Give its application. (6)
- Q.6** a. Draw a block diagram of a processor, memory, peripheral, and DMA controller connected with a system bus, in which the peripheral transfers 100 bytes of data to the memory using DMA. Show all relevant control and data lines of the bus, and label component inputs/outputs clearly. Draw a timing diagram showing what happens during the transfer; skip the 2nd through 99th bytes. (10)
- b. Discuss the advantages and disadvantages of using memory-mapped I/O versus standard I/O and Also explain the benefits that an interrupt address table has over fixed and vectored interrupt methods. (8)
- Q.7** a. Explain any three testing and debugging techniques used in embedded system. (6)
- b. Describe each tool that has enabled the elevation of software design and hardware design to higher abstraction levels. (6)
- c. What is hardware/software co-simulation? What is a key method for speeding up such simulation? (6)