

**Total No. of Pages : 02**

**Total No. of Questions : 09**

**B.Tech.(ECE) (2011 Batch) (Sem.-7,8)**

# EMBEDDED SYSTEMS

**Subject Code : BTEC-701**

**Time : 3 Hrs.**

**Max. Marks : 60**

**INSTRUCTION TO CANDIDATES :**

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt **ANY FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt **ANY TWO** questions.

## SECTION-A

**Write briefly :**

- a) Compare little and big-endian modes in ARM processor.
- b) Differentiate between CPSR and SPSR.
- c) Implement the statement  $x = (a+b) - c$ , using ARM instructions.
- d) Discuss the role of write-back cache in ARM processors.
- e) Explain the instructions LDC and MRC with an example.
- f) Assume that  $x$  is an array of integers. Convert the following C statements into ARM assembly language.
  - (a)  $x[8] = 100;$
  - (b)  $x[10] = x[0];$
- g) Explain Jazelle mode of ARM.
- h) How is ARM processor different from other processors?
- i) Give different applications of ARM processors.
- j) List down the differences between ARM and Thumb Instructions.

### SECTION-B

2. Which are the different conditional flags of ARM processor?
3. Explain the use of pointers with example.
4. Calculate the effective address of the following instructions if register R3=0x4000 and register R4 = 0x20 (i) STRH R9,[R3,R4] (ii) LDR R8,[R3,R4,LSL#3] (iii) LDR R7,[R3],R4
5. Differentiate between conditional jump and unconditional jump instructions using appropriate examples.
6. Write an embedded C program to rotate stepper motor in clockwise direction. Draw a neat interfacing diagram of stepper motor with ARM7 processor.

### SECTION-C

7. Use ldm and stm to write a short sequence of ARM assembly language to copy 16 words of data from a source address to a destination address. Assume that the source address is already loaded in r0 and the destination address is already loaded in r1. You may use registers r2 through r5 to hold values as needed. Your code is allowed to modify r0 and/or r1.
8. With a neat diagram explain the different general purpose registers of ARM processors.
9. Write a program to display "ENGINEERING" on LCD using LPC2148 ARM processor. Also draw interfacing diagram.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**