Roll No. | | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ECE) (2012 to 2017) (Sem.–7)

EMBEDDED SYSTEMS

Subject Code : BTEC-701

M.Code : 71910

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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 :

1. Explain the concept of thumb instructions in ARM processor.
2. Which assembly instruction would you use to load 4 words starting from the memory location 0 × 80000000 into the registers r0-r3?
3. Describe the significance of ARMsd and ARMulator.
4. Explain process status register (PSR) for ARM.
5. Assume that x is an array of integers, and i and j are integers. Convert the following C statements into ARM assembly language.
   a. x[i]=j;
   b. x[j]=x[i];
6. Compare little and big-endian modes in ARM processor.
7. Implement the statement x= (a+b)-c, using ARM instructions.
8. Explain the instructions LDC and MRC with an example.
9. Explain Jazelle mode of ARM.
10. Give different applications of ARM processors.

SECTION-B

11. Discuss the role of L1 and L2 cache memories in ARM processor.

12. How ZIGBEE can be interfaced with an ARM processor? Draw and explain an interfacing diagram.

13. With a neat diagram explain the different general purpose registers of ARM processors.

14. Calculate the effective address of the following instructions if register R3 = 0 × 4000 and register R4 = 0 × 20

    a) STRH R9, [R3, R4]

    b) LDRB R8, [R3, R4, LSL #3]

    c) LDR R7, [R3], R4

15. 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

16. What are addressing modes? Explain various addressing modes with two examples of each used for ARM processors.

17. 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.

18. 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.