

GUJARAT TECHNOLOGICAL UNIVERSITY
ME SEMESTER - 1 • EXAMINATION – WINTER 2014

Subject Code: 2710311**Date: 07/01/2015****Subject Name: Embedded System for Instrumentation****Time: 2:30 PM – 5:00 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) Discuss the features of ARM Cortex ó M3/M4 processors in brief. **07**
 (b) Explain SP, LR, PC & Control register of Cortex M3/M4 processor in brief. **07**
- Q.2** (a) Explain the working of following instructions. **07**
 1) ADDS.N R0,#1 2) VMRS.F32 R0, FPSCR
 3) STRD Rd1,Rd2 4) LDRH Rd, [Rn, #offset]!
 5) LDR Rd,[Rn], #offset
 (b) Draw and explain basic memory map of Cortex M3/M4 processor. Also give address ranges. **07**
- OR**
- (b) Write an ALP to display 0 to 9 on seven segment LED display sequentially with 1 second delay. **07**
- Q.3** (a) Explain xPSR register format and function in brief. **07**
 (b) Write an assembly language program to find the no of negative no is an array of 32 bit number. Also find the sum of all negative numbers. The length of the array is stored in register R0. **07**
- OR**
- Q.3** (a) Explain how interrupts are managed by Cortex M processors in brief. **07**
 (b) Write a program to sort an array of ten 32 bit numbers in ascending order. **07**
- Q.4** (a) Write an ALP to generate the square wave of 10 Hz frequency. **07**
 (b) Write an assembly language program to find the factorial of 9. **07**
- OR**
- Q.4** (a) Write a program to multiply a 64 bit multiplicand with 32 bit multiplier. **07**
 (b) Enlist the various types of data types available in in ARM Architecture Including Cortex-M Processors with their size and range. **07**
- Q.5** (a) Write an assembly language program to find the length of a null terminated string. **07**
 (b) With the help of necessary diagrams explain reset & reset sequence. **07**
- OR**
- Q.5** (a) What is lazy stacking? Enlist the different scenario for the same and explain any two along with the key element. **07**
 (b) Explain the importance of Exclusive Excess. Explain the access sequence for requesting a resource. Also discuss the condition under which the Exclusive excess fails. **07**
