Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (INFORMATION TECHNOLOGY)

MAKE UP EXAMINATIONS, JAN/FEB 2017

SUBJECT: EMBEDDED SYSTEMS [ICT 303]

REVISED CREDIT SYSTEM
(/ /2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE** full questions.
- Missing data may be suitably assumed.

1A. Explain the following ARM instructions with an example to each
(i) RSB (ii) ADCS (iii) UMULL (iv) MSR (v) CMN **(05)**

1B. Discuss the role of UART and MAX 232 converter in serial communication. **(03)**

1C. Differentiate between level triggered and edge triggered interrupts. **(02)**

2A. Write an assembly language program to find the factorial of an unsigned byte available in the code memory and store the result in the data memory **(05)**

2B. Explain the salient features of CISC architecture. **(03)**

2C. Differentiate between microcontroller and microprocessor. **(02)**

3A. Write a C program to transfer the message "Inspired by life" serially on TxD0 (P0.2, function 2), at 9600 baud. Assume 1-start bit, 1- stop bit and 8-bit data (PCLK=3 MHz) **(05)**

3B. Explain how the intensity of an LED can be controlled using PWM. **(03)**

3C. What are the merits and demerits of memory mapped IO? **(02)**

4A. Define the "Resolution of a DAC. Write an embedded C program to generate a sawtooth waveform at A_{OUT} (P0.26, function-3) with peak to peak amplitude of 3.3 volts. **(05)**

4B. It is required to turn ON an LED whenever ADC Channel-0 voltage input is greater than ADC Channel-1 voltage input. Explain how this task can be accomplished using BURST mode of ADC. **(03)**

4C. Differentiate between peripheral clock and circuit clock in ARM microcontroller. **(02)**

5A. Assume that output of a square wave generator (Frequency range 0-9 Hz) is connected to EINT1 (P2.11, Function-01) input. Write an embedded C program using interrupt to **(05)**

display the frequency of this square waveform on the seven-segment display.

5B. Why do we require double buffering in DAC? How is it enabled? **(03)**

5C. Differentiate between fully ascending and fully descending stack. **(02)**

6A. Explain the necessity of capture and match pins in ARM microcontroller. Write an embedded C program to generate a square wave on MAT0.1(P1.29, Function-03) whose frequency is one sixth of the square wave input at CAP0.1(P1.27, Function-03). **(05)**

6B. What are the salient features of a stepper motor? Why do we require a driver circuit to interface it to the microcontroller? **(03)**

6C. Explain the role of FIOMASK and FIODIR registers in GPIO programming. **(02)**