Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

IV SEMESTER B.TECH. (COMPUTER AND COMMUNICATION ENGINEERING)

MAKEUP EXAMINATIONS, JUNE 2018

SUBJECT: EMBEDDED SYSTEM DESIGN [ICT 2253]

REVISED CREDIT SYSTEM

21/06/2018

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data, if any, may be suitably assumed.

1A. Define the term "Addressing mode". Explain various addressing modes of ARM microcontroller with suitable examples. **5**

1B. Explain various SFRs available in ARM microcontroller to configure and handle GPIO interrupts. **3**

1C. Given PCLK=3 MHz and PR=0. Determine the value that is be loaded to MR0 to get a square waveform of frequency of 100 Hz on MAT 1.0. **2**

2A. Write an assembly language program to convert a 4-digit BCD number available in the code memory into hexadecimal and store the result in the data memory. **5**

2B. Explain with a neat diagram, how the 3-digit seven segment display is interfaced with ARM microcontroller. **3**

2C. Bring out the salient features of RISC family of microcontrollers. **2**

3A. Explain the following ARM instructions with an example for each:
i) TEQ ii) MSR iii) BGT iv) CMN v) RSBLS **5**

3B. Write an embedded C program using DAC to generate a square waveform with peak to peak amplitude of 3.3 volts and frequency 4 KHz at A_{OUT} (P0.26 , function-3). **3**

3C. Differentiate between the software mode and burst mode of operation of an ADC. **2**

4A. Write an embedded C program using interrupts to generate a square waveform of frequency 200 kHz on P0.0 using TIMER-1 while simultaneously displaying the number of pulses received at EINT2 (P2.12, function-2) on the LEDs connected to P0.11-P0.4. (PCLK = 3 MHz) **5**

4B. What is fully ascending stack? Explain the role of STM and LDMDB instructions in implementing a fully ascending stack with an appropriate example. **3**

4C. Explain various SFRs used to set the baud rate for serial communication in ARM microcontroller. **2**

5A. Write an embedded C program to glow an LED connected to P1.23 (PWM1.4, function-2) with 75% intensity level as long as switch connected to P2.12 is pressed and 25% intensity level whenever the switch is released. **5**

5B. Explain the mechanism for peripheral clock generation in ARM microcontroller. **3**

5C. Explain the operation of LCD in 4-bit mode. **2**