Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University

FOURTH SEMESTER B. Tech. (E & C) DEGREE END SEMESTER EXAMINATION
MAY/JUNE 2016
SUBJECT: MICROCONTROLLERS AND APPLICATIONS (ECE - 3284)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates
- Answer **ALL** questions.
- Missing data may be suitably assumed.

1A. With neat diagram explain the architecture of 8051 microcontroller. Explain the function of all register available in 8051 microcontroller.

1B. In water treatment plant, a dosing pump is used to add chemicals to the water every one hour. The time required for adding the chemicals ranges from 30ms to 100ms which needs to be adjusted. A logic signal becomes high when the chemical addition process begins and the logic signal goes low after the chemicals have been added. Show how the 8051 timer1 can be configured to monitor the time taken to add the chemicals.

1C. The following shows crystal frequency for three different 8051 based systems. Find the period of the machine cycle in each case.

a) 16MHz b) 11.0592 MHz c) 20MHz d) 18MHz

(5+3+2)

2A. Draw the interfacing diagram of 8051 with DAC and write a program to generate a square wave of 5Khz frequency using DAC.

2B. Write a program to toggle all the bits of port1 with suitable time delay.

2C Differentiate between RISC and CISC processors.

(5+3+2)

3A. Interface common anode seven segment display to 8051 microcontroller. Write a program to display "8085" on the seven segment display.

3B. Write a program to copy the values 55h into RAM memory locations 40h and 45h using

a) Direct addressing b) register indirect addressing mode with loop

3C. Describe the functions of following Instructions :

a) SWAP A b) CPL A c) SETB bit d) MOV C

(5+3+2)

4A. With neat diagram explain the different operating modes of 8051 timer.

4B. Write the following programs:

a) Create a square wave of 50% duty cycle on bit 0 of port1
b) Create a square wave of 66% duty cycle on bit 3 of port1

4C. Draw the format of SCON register and write the functions of each bit.

(5+3+2)

5A. Write an 8051 serial communication program to transmit a given message "MICROCONTROLLER" at 9600 baud rate. Assume that XTAL = 11.0592 MHz.

5B. Explain the functions of each bit in the following SFRs i) IP ii) TCON

5C. Write a program to perform the following ;

a) Keep monitoring the P1.2 bit until it becomes high

b) When P1.2 becomes high ,write value 45h to port0 and

c) Send a high to low pulse to P2.3

(5+3+2)