Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VI SEMESTER B.Tech (BME) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: Microcontrollers (BME-304)
(REVISED CREDIT SYSTEM)

Thursday, April 20, 2017 (2.00 p.m. - 5.00 p.m.)

TIME: 3 HOURS **MAX. MARKS: 100**

Instruction to Candidates:

Answer any FIVE full questions.
Assume relevant data if missing.
Give diagrams wherever necessary.

1. (a) How many status flags are available in the 8051 microcontroller? What are the significances of those flags? (1+7)

   (b) How do you implement bus topology using the SPI sub-system of the 68HC11 microcontroller? Illustrate. (5)

   (c) Write a memory efficient 8051 assembly language program to convert a 2-digit hexadecimal number available in the external data memory location 8000H into the corresponding decimal number. (7)

2. (a) What are the different instructions available in the instruction set of the 8051 to implement subroutines? Explain the instructions with an example to each. (6)

   (b) How does the timer of the 8051 microcontroller functions in the auto-reload mode? Explain. (6)

   (c) What is programmer's model? Draw the programmer's model of the 68HC11 microcontroller, and write the significance of each resource. (8)

3. (a) How do you interface two seven segments to the 8051 microcontroller to continuously display the message "Oh"? Draw the interface diagram and write an appropriate assembly language program. (12)

   (b) How do you make use of the serial sub-system of the 8051 as a shift register? Explain. (8)

4. (a) Write an 8051 assembly language program to convert a 2-digit hexadecimal number in to ASCII code. Assume that the number is available in the internal RAM of the 8051. (7)

(b) How do you implement software interrupts in the 8051 microcontroller? Illustrate with an example. (5)

(c) List and explain the rotation and swap instructions of the 8051 microcontroller. (8)

5. (a) Draw the structure of the 68HC11 register "BAUD" and write significance of each bit in the register. (7)

(b) Generate a square wave of frequency 100 Hz with a 50% duty cycle of 25% using DAC interface. Assume an XTAL of 12 MHz. (7)

(c) Make a list of interrupting sources of the PIC microcontroller, and write their significances. (6)

6. (a) How do you implement a time delay of duration 1 mS using the "Timer 1" of the 8051 microcontroller operating in Mode-1? Assume an XTAL of 12 MHz. Write the delay calculations. (10)

(b) Explain the following with reference to the PIC microcontroller: (10)

(i) W register

(ii) PC and PC LATCH

(iii) Stack.