Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VI SEMESTER B.Tech (BME) DEGREE MAKE-UP EXAMINATIONS, JUNE 2017

SUBJECT: Microcontrollers (BME-304)

(REVISED CREDIT SYSTEM)

Tuesday, 13th June 2017: 2.00 p.m. - 5.00 p.m.

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

Instruction to Candidates:

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

1. (a) Draw the format of the 8051 registers IE and IP, and write significance of each bit of the registers. (12)

   (b) How do you implement a time delay of 1 mS using the Timer 0 of the 8051 microcontroller? Explain. (8)

2. (a) How does the register PSW of the 8051 helps in selecting register banks? Explain. (6)

   (b) What are the different operating modes of the 8051 timers? How do you configure the mode? (6)

   (c) Draw the format of the register CCR of the 68HC11 and write the significance of each bit. (8)

3. (a) How do you interface an 8-channel, 8-bit ADC to the 8051 microcontroller? Write an assembly language program to digitize an analog signal of frequency 100 Hz applied to channel-1 of the ADC. (12)

   (b) How do you make use of the UART of the 8051 in mode-1? Explain. (8)

4. (a) Write an 8051 assembly language program to add ten 2-digit decimal numbers available in the internal data memory. Store the result in the registers R0 and R1 from the default register-bank. (7)

   (b) What is the significance of initializing the stack pointer in the 8051 microcontroller? Justify your answer with an illustration. (5)

(c) List and explain the unconditional branching instructions of the 8051 microcontroller. (8)

5. (a) Draw and explain basic topologies of SPI sub-system of the 68HC11 microcontroller. (8)

(b) Generate a square wave of frequency 1 KHz with a duty cycle of 50% on P0.1 pin of the microcontroller. (8)

(c) Write the features of PIC microcontroller. (4)

6. (a) Explain in detail the following instructions of the 8051 microcontroller: (12)

(i) MUL AB

(ii) DIV AB

(iii) ANL C, /bit

(iv) JNB bit, rel

(b) Explain with an example to each, the following addressing modes of the 68HC11 microcontroller: (8)

(i) Direct

(ii) Extended

(iii) Indexed

(iv) Inherent