Reg.	No.



MANIPAL INSTITUTE OF TECHNOLOGY

(A Constituent Institute of Manipal University)

Manipal – 576 104



VI SEMESTER B.TECH (BME) DEGREE MAKE-UP EXAMINATIONS JUNE/JULY 2016 **SUBJECT: Microcontrollers (BME 304)**

Wednesday, July 06, 2016 (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)	Which ports of the 8051 microcontroller are useful in interfacing external	(4)
		memory and peripherals? Illustrate with relevant schematics.	
	(b)	List and explain the role of Port 3 pins of the 8051 microcontroller.	(6)
	(c)	Draw the programming model of the 68HC11 microcontroller and explain the significance of each of the resource.	(6)
	(d)	Name and draw formats of the 8051 registers useful in configuring and controlling the interrupts.	(4)
2.	(a)	How do you make use of "Timer-1" of the 8051 to generate a time delay of 1 mS.	(7)
	(b)	Explain the different SPI topologies possible with the 68HC11 microcontroller.	(1+6)
	(c)	Make a list and explain the interrupting sources of the PIC microcontroller.	(6)
3. (a)		Write an 8051 assembly language program to increment a 4-digit decimal number present in the register "DPTR".	(8)
	(b)	Explain the following addressing modes of the 8051 with an example to each:	(6)
		(i) Indexed addressing mode	
		(ii) Relative addressing mode	
		(iii) Direct addressing mode	
	(c)	Write an 8051 assembly language program to implement a ring counter in the register A. Assume an initial count of 01H in the register A.	(6)

- (10)4. (a) Making use of the 8051 microcontroller and an appropriate interface circuit generate a saw-tooth waveform of amplitude +5 V and frequency 200 Hz. (b) How do you interface an 8-bit ADC to the 8051 microcontroller? Explain with (10)the help of a circuit schematic and an appropriate assembly language program to obtain digital equivalent of an analog input signal. 5. (a) Using the 8051 microcontroller and seven-segment display devices, design (10)a 2-digit decimal up-counter to count from 00 to 99. What are the methods available to expand hardware interrupts of the 8051 (10)(b) microcontroller. Explain. 6. (a) Write the significance of each bit of the status register of the 8051 (6)microcontroller. What is the significance of the register "PCON" of the 8051? Explain. (b) (5)(c) How do you implement software interrupt in the 8051 microcontroller? (5) Illustrate with an example. (d) (4)
 - (d) How do you allow or bypass the internal program memory of the 8051? (4)Explain.