Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

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V SEMESTER B.Tech. (BME) DEGREE MAKE-UP EXAMINATIONS, DEC/JAN 2017-18 SUBJECT: MICROCONTROLLER BASED SYSTEMS (BME 3102) (REVISED CREDIT SYSTEM)

Monday, 1st January 2018: 2 PM to 5 PM

TIME: 3 HOURS

MAX. MARKS: 100

Instructions	to	Candidates:
inou actions	vv	Culturation

- 1. Answer all FIVE full questions.
- 2. Draw labeled diagram wherever necessary.
- 3. Assume suitable missing data, if any.
- 1. (a) What are the functions assigned to Port3 pins of the 8051 microcontroller? Make a list.
 - (b) Draw the structure of the 8051 microcontroller's internal and external data and program 6 memory space.
 - (c) Draw and explain the registers associated with the interrupts of the 8051 microcontroller. 10
- 2. (a) How does the Serial Port of the 8051 functions as a shift register in Mode 1? Explain. 6
 - (b) What are the significances of the bits in the Register "PSW" of the 8051 and the 10 "STATUS" register of the PIC microcontroller?
 - (c) How do you start the timers of the 8051 microcontroller using the hardware interrupts? 4 Explain.
- **3.** (a) How does the stack of the 8051 microcontroller functions? Illustrate. **4**
 - (b) With an example to each, explain the following instructions of the 8051 microcontroller. 10
 - (i) ANL C, /b
 (ii) MOVC A @A+DPTR
 (iii) XCHD A, @Rp
 (iv) LJMP addr16

- (c) Write an 8051 instruction for each of the following addressing modes.
 - (i) Implied addressing
 - (ii) Direct addressing
 - (iii) Immediate addressing
 - (iv) Short addressing for branching
 - (v) Indirect addressing
 - (vi) Register addressing
- 4. (a) Write an 8051 assembly language program to convert a hexadecimal number present in 6 the memory location 1050H in to corresponding decimal number and store it in the next consecutive memory location.
 - (b) Implement a two digit alphanumeric display using the 8051 microcontroller and common 10 anode seven-segments, and program the microcontroller to display the information "8H" in the display continuously. Let the display refresh rate be 200Hz.
 - (c) Write a C program to convert a two digit hexadecimal number available in available in 4 the accumulator of the 8051 microcontroller in to corresponding ASCII code.
- 5. (a) Write a RESET routine for the 8051 microcontroller, which configures the Timer1 in 6 auto-reload mode, Timer 0 in 16-bit mode, enables all interrupts and starts executing a program beginning at address 4100H.
 - (b) List and explain the interrupts of the PIC microcontroller.
 - (c) The timer T0 of the 8051 microcontroller operating at a speed of 11.0592 MHz counts
 47832 machine cycles while executing an N bytes long program. Calculate the time taken by the time taken by the microcontroller to execute the program.
 - (d) Configure the serial port of the 8051 microcontroller to operate in Mode1, and for 5 9600 BAUD. Assume XTAL = 11.0592MHz.

5