

3 HOURS

[TOTAL MARKS: 80]

- N.B.** (1) Question No. 1 is compulsory.  
 (2) Attempt any **Three** questions out of remaining **five** questions.  
 (3) Assume any suitable data if necessary.  
 (4) Figure to the right indicates full marks.



1. Attempt any four. 20
- States important features of PIC18F microcontroller.
  - Draw and explain ADC modules of PIC18F microcontroller.
  - Explain SPI module of PIC18F microcontroller.
  - Explain basic concept of RTOS.
  - Explain following instructions with example:
    - DECFSZ
    - BTFSS
    - RETFIE.
2. a) Define embedded system. States various characteristics and design challenges of embedded system. 10
- b) What is task? Explain various task scheduling algorithms for RTOS. 10
3. a) Draw and explain block diagram of PIC18F microcontroller. 10
- b) Explain CCP module of PIC18F microcontroller in capture and compare modes. 10
4. a) Write a program to load number 7FH in WREG and subtract it from the number 28H and display the result at PORTC and also save it in registers 30H. Identify the status of all the flags after the subtraction. 10
- b) Write a program to copy the value 55H into RAM locations 40H to 45H using Direct and Register Indirect Addressing (without loop) Modes for PIC18F microcontroller. 10
5. a) Write a program to toggle RB1 a total of 200 times. Use file register of RAM Location 32H to hold counter value. 10
- b) Interface 4x4 matrix key with PIC18F and explain its operation in detail. 10
6. a) Interface a Stepper Motor to PIC18F microcontroller and write a program to control the angle and direction of Stepper Motor rotation. 10
- b) Write a short note on Inter-integrated Circuit (I<sup>2</sup>C) Protocol. 10
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