(3 Hours)   **[Total Marks:80]**

N.B.
- **(1)** Question no.1 is compulsory.
- **(2)** Attempt any three from the rest.
- **(3)** Make any suitable assumption wherever required.

Q.1   Answer any four.
- **(a)** What do you mean by prescaling of PIC 18 timers?   5M
- **(b)** Explain the internal bus structure of PIC18 microcontroller.   5M
- **(c)** Explain the pipelining concept in PIC 18 Microcontroller.   5M
- **(d)** Explain status register and BSR register of PIC18.   5M
- **(e)** What are the different data transfer schemes?   5M

Q.2
- **(a)** Explain the memory organization (Program and Data Memory) of PIC18 Microcontroller.   10M
- **(b)** Write a program in assembly language to multiply and divide two 8 bit numbers using PIC18 Microcontroller.   10M

Q.3
- **(a)** Explain all the instructions related to stack and subroutine with example.   10M
- **(b)** Write a C18 program to send the message "University of Mumbai" to the serial port continuously. Assume a SW is connected to pin RB2. Monitor its status and set the baud rate as follows: 10M

  SW=0, Baud rate=9600

  SW=1, Baud rate=38400

  Assume crystal frequency=10MHz

Q.4
- **(a)** Explain the SPBRG, TXSTA and RCSTA registers used in serial communication.   10M
- **(b)** Write a C18 program using Timer 0 to generate a square wave of 100Hz frequency on Port B pin RB0. Use 16 bit programming technique with 128 prescaler. The internal frequency is 10 MHz.   10M

Q.5
- **(a)** Draw and explain LCD interfacing with PIC 18 Microcontroller.   10M
- **(b)** Draw the interfacing diagram and write C18 program to interface Dc Motor to monitor the status of switch connected to pin RC2 and do the following   10M

  (1) If switch = 0, the Dc Motor moves with 50% of duty cycle.

  (2) If switch =1, the Dc Motor moves with 25% of duty cycle.

Q.6   Write a short note on any two
- **(a)** ADC interfacing with PIC 18 Microcontroller.   10M
- **(b)** CCP modules of PIC 18 Microcontroller.   10M
- **(c)** Stepper Motor interfacing with PIC 18 Microcontroller.   10M

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