314338

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1.   **Attempt any FIVE of the following :**   **10**

   a) List any four features of 8051 microcontroller.

   b) Give any two characteristics of embedded system.

   c) Draw format of TMOD register.

   d) Draw format of SCON register.

   e) Define SPI with it's application.

   f) Draw the two switch and two LED's interfacing diagram with 8051 microcontroller.

   g) Define stepper motor and step angle.

Marks

2. Attempt any THREE of the following :   **12**

a) List the priority of interrupts of 8051 microcontroller with respective interrupt destination.

b) Compare between I^2C and CAN protocols on the following points :-

   i) Data transfer rate

   ii) Number of Fields

   iii) Addressing bits

   iv) Applications

c) Draw labelled diagram to interface 16×2 LCD display with 8051. State function of pins –

   i) RS

   ii) R/W

d) Draw interfacing of IR sensor with microcontroller and write embedded 'C' program for obstacle detection.

3. Attempt any THREE of the following :   **12**

a) Compare between synchronous and asynchronous type of serial communication.

b) Draw and explain interfacing of relay with 8051 microcontroller.

c) Explain power saving operation of 8051 microcontroller.

d) Draw interfacing of PIR sensor with microcontroller and write embedded 'C' program for motion detection.

4. Attempt any THREE of the following :   **12**

a) Compare between Von-Neuman and Harward architecture.

b) Write embedded 'C' program to receive data serially from Rx pin and send the data on port 1 continuously. Assume baud rate = 9600 and crystal frequency = 11.0592 MHz.

c) Draw 9 pin RS 232 connector and state significance of DTR and DSR signal.

Marks

   d) Discuss the features of each of the following –

      i)   Bluetooth

      ii)   ZigBee

   e) Draw labelled diagram to interface DC motor with 8051. Write 'C' program to rotate the motor continuously.

5.   **Attempt any <u>TWO</u> of the following :**   **12**

   a) State any four Arithmetic operations in embedded 'C' language with one example.

   b) Draw interfacing diagram of 7-segment LED display to 8051 and write a program to display 0 to 9 continuously.

   c) Draw interfacing diagram to control stepper motor connected to port 2 through IC ULN 2003 and write embedded 'C' program to rotate stepper motor in clockwise direction continuously.

6.   **Attempt any <u>TWO</u> of the following :**   **12**

   a) Explain the four timer modes in 8051.

   b) Draw interfacing diagram of ADC with 8051 microcontroller and explain function of following pins of ADC –

      i)   SOC

      ii)   EOC

      iii) OE

   c) Write the classification of an embedded system and write any two examples of an –

      i)   small scale embedded system.

      ii)   Medium scale embedded system.