314331

12526

3 Hours / 70 Marks   Seat No. ☐☐☐☐☐☐☐☐☐

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

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

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

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

Marks

1.   **Attempt any <u>FIVE</u> of the following:**   **10**

a) Give two advantages of microcontroller over microprocessor in control applications.

b) List any two IDE (Integrated Development Environment) tools.

c) Draw interfacing dia. of 4 × 4 matrix keyboard.

d) List four modes of data communication.

e) Give classification of embedded system.

f) List two advantages and disadvantages of embedded system.

g) Write down 'C' language programme for interfacing push-botton with AT89C51.

Marks

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

   a) Develop 'C' language program to toggle all bits of port P_1 continuously for μC 89C51.

   b) Compare microprocessor and microcontroller. (Any four points)

   c) List any four logical operators in 'C' with example.

   d) Draw interfacing dia. for 16 × 2 LCD display.

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

   a) Describe the given function in Arduino IDE :–

      i) setup ( )

      ii) loop ( )

      iii) pinmode ( )

   b) Draw interfacing diagram of ADCO808. with 89C51 microcontroller.

   c) With neat diagram give features of :–

      i) Harvard architecture

      ii) Von Neumann architecture.

   Also state example of each architecture.

   d) Write function of :–

      i) Linker

      ii) Compiler

      iii) Assembler

      iv) Debugger.

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

   a) Give function of following 8051 pins :–

      i) ALE

      ii) $\overline{EA}$

      iii) $\overline{PSEN}$

      iv) RST.

   b) Write an 8051 C program to send values OO-FF to Port P1.

   c) Describe SPI protocol with diagram.

   d) Compare features of real time operating system (RTOS) and general operating system (OS). (Any four points)

   e) Give features of Arduino also state its application area. (Any two points)

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

   a) List microcontroller from MCS-51 family. Compare features of 8051 and 8052 microcontroller. (04 point)

   b) Draw interfacing dia. of stepper motor with 89C51 microcontroller and write a 'C' program to rotate motor in anti-clock wise direction. Motor has step angle 3.6°.

   c) State three features of I_2C and USB serial communication protocols.

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

   a) Explain deadlock condition in RTOS with suitable sketch.

   b) Compare assembly language and embedded 'C' language. (Any six points)

   c) Interface DAC 0808 with 8051 and write 'C' programme to generate sawtooth waveform.

————