22483

12425

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 answers with neat sketches wherever necessary.

(4) Assume suitable data, if necessary.

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

Marks

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

(a) List any two features of Intel Pentium-4 processor.

(b) Draw format of IE and IP SFR.

(c) Explain Input/output port structure of 8051.

(d) Write specifications of ADC0808IC.

(e) Explain with suitable example delay function in Arduino.

(f) Explain the use of pin functions RS, RW and EN on 16 × 2 LCD (any 2).

(g) What are applications of microcontroller 8051 ? (any 2)

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

(a) List types of buses found in computers and describe the purpose of each type of bus.

(b) Draw format of PSW register and explain each bit of it.

(c) Find the values of TMOD to operate as timer in following modes :

(i) mode 1 timer 1,

(ii) mode 2 timer 0,

(iii) mode 0 timer 1.

(d) Draw the interfacing diagram of 4 × 4 matrix keyboard to 89C51.

(e) State the features of AT328 microcontroller.

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

(a) What is the significance of pipelining structure in microcontroller ?

(b) Illustrate data types used in 'C' with their ranges used for microcontroller.

(c) Draw and explain bits of SCOM SFR in 8051.

(d) Write steps to interface switch with microcontroller.

(e) For Arduino, interpret following functions and write what action occurs after execution of function :

(i) digital write (h, low),

(ii) sensor value = anlog Read(1),

(iii) Delay (500)

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

(a) Develop 'C' program to rotate the stepper motor by two complete rotations and then stop, assume step angle 1.8°.

(b) If the content of ACC=OX04 and P1=OXF3. State the result after execution of following statements independently :

(i) result = ACC & P_1

(ii) Result = ACC ^P_1

(iii) Result = ACC | P_1

(iv) Result = ~P_1

(c) Develop 'C' program to generate delay of 50 m sec for microcontroller 89C51 with crystal frequency 1.1.0592 MHz.

(d) Draw LED interfacing diagram with Arduino.

(e) Define baud rate and list various standard baud rates for serial communication.

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

(a) Develop 'C' program to receive bytes of data serially and put them in P_1. Set the baud rate at 4800, 8-bit data and 1 stop bit.

(b) Write a 'C' program to transfer the data from port P_0 to Port P_1.

(c) Explain the function of the pins :

(i) SOC

(ii) EOC

(iii) OE

(iv) ALE

(d) Which architecture is used for 8051 microcontroller design ? Distinguish between RISC and CISC.

(e) State the function of the following pins (i) ALE, (ii) $\overline{\text{PSEN}}$, (iii) $\overline{\text{EA}}$ (iv) GND.

6. Attempt any TWO : **12**

(a) Develop 'C' program that continuously gets a single bit of data from $P_{1.7}$ and sends it to $P_{1.0}$, while simultaneously creating a square wave of 200 μs period on pin $P_{2.5}$. Use timer 0 to create the square wave. Assume that XTAL = 11.0592 MHz.

(b) Sketch diagram showing DC motor interfacing with Arduino and write C program to operate relay.

(c) Draw interfacing diagram of 16 × 2 LCD display with 89C51 and write 'C' program to display character 'A' on it.
