17509

14115

3 Hours / 100 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) 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. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) Compare between microprocessor and microcontroller (any four points).

(ii) Draw the pin diagram of 20 × 4 LCD display. What is the function of RS, EN and R/W pins.

(iii) What are the various data types used in C? Also give their value range.

(iv) Draw and explain reset circuit used for 8051 microcontroller.

b) **Attempt any <u>ONE</u> of the following:** **06**

(i) Describe the timer modes of 8051 microcontroller.

(ii) List the addressing modes of 8051 microcontroller with one example each.

P.T.O.

Marks

2. Attempt any <u>TWO</u> of the following: **16**

a) Classify the instruction set of microcontroller 8051. Give one example of each.

b) Draw the interfacing diagram of ADC 0809 with microcontroller 8051. Write 'C' language program to generate 50Hz sq. wave with crystal freq = 12MHz.

c) Draw the interfacing diagram of stepper motor with 8051 microcontroller. Draw the flowchart for rotating stepper motor in clockwise direction. (Program not expected).

3. Attempt any <u>FOUR</u> of the following: **16**

a) Draw the format of PSW SFR and describe function of each bit.

b) Compare between 8051 and 8052 microcontroller.

c) Write C program to continuously toggle all bits of port O with same delay.

d) Compare between RISC and CISC machines.

e) Draw the interfacing diagram of four common cathode 7 segment display connected in multiplexed mode with 8051 microcontroller.

4. a) Attempt any <u>THREE</u> of the following: **12**

(i) Draw the interfacing diagram for temperature measurement using LM35, ADC0808 with microcontroller 8051.

(ii) Write instruction to perform following task using C operators:

1) Shift data bit wise 4 times to right

2) Shift data bit wise 4 times to left.

(iii) Compare between EPROM and flash memory.

(iv) List the alternate functions of port 3.

Marks

b) **Attempt any <u>ONE</u> of the following:** **06**

(i) Describe the function of following instructions of 8051 microcontroller:

1) SWAP A

2) DIV AB

3) RLA

4) XCH A, RO

5) SETB C

6) DA A

(ii) With suitable diagram describe the memory organisation of internal program and data memory.

5. Attempt any <u>TWO</u> of the following: **16**

a) Write C program to transfer the message "INDIA" serially at baud rate 4800 bps, 8 bit data, 1 stop bit. Assume crystal frequency 11.0592 MHz.

b) Write assembly language program to transfer array of ten numbers stored in memory location 50 H to memory location 70 H.

c) Draw interfacing diagram to connect 8 LEDs on port 2 and 8 switches on port O. Write C program to read the status of switches and send to port 2.

Marks

6. Attempt any <u>FOUR</u> of the following: 16

a) Draw and describe the IP SFR format for 8051 microcontroller.

b) Draw interfacing diagram to interface 3×3 key matrix to 8051 microcontroller.

c) Describe the following assembler directives with one example:

(i) ORG

(ii) DB

(iii) EQU

(iv) END

d) Describe the dual role of port O of microcontroller 8051.

e) Draw the interfacing diagram to interface relay with 8051 microcontroller.