22537

12425

03 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) 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 FIVE of the following: **10**

a) Define address bus and controlbus.

b) Find the capacity of memory to be addressed using 10 address lines.

c) Define assembler and compiler.

d) Draw format of TMOD SFR for timer in 8051.

e) Compare Von-Neuman and Harvard architecture based on memory interfacing and speed of operation.

f) Compare program memory and data memory.

g) State four applications of a stepper motor.

Marks

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

a) Draw interfacing diagram of DAC with 8051. Write an ALP to generate sawtooth wave form.

b) Compare microprocessor and micro controller on the basis:

i) Memory organization

ii) Accessing time

iii) Boolean operation (on individual bit)

iv) Pin Programibility

c) Explain the functions of port0 and port2.

d) Draw interfacing diagram of 4kbyte EPROM and 2Kbyte of RAM to 8051. Draw the memory map.

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

a) Draw and explain RAM allocation table in 8051 micro controller.

b) State different addressing modes of 8051 micro controller describe any two with one example.

c) Describe the instructions with examples

i) MOVC A, @A +DPTR

ii) AJMP addr II

iii) XCHD A, <byte>

iv) DJNZ <byte>, <rel-addr>

d) State different interrupts in 8051 and write their vector addresses with clearly indicating the priority of interrupts.

Marks

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

a) Draw interfacing diagram of stepper motor with 8051 and write an ALP to rotate motor in anticlockwise direction.

b) Describe the function of following Pins:

i) $\overline{PSEN}$

ii) $\overline{EA}$

iii) ALE

iv) RESET

c) Draw interfacing diagram of DAC 0808 with 8051 and write an ALP to generate triangular wave form.

d) Draw interfacing of temperature controller LM35 sensor with 8051 and write an ALP to read temperature.

e) Develop an ALP to transmitt message "MSBTE" serially at baud rate of 4800, 8 bit data, 1 stop bit. Assume crystal frequency of 11.0592 MHz.

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

a) Draw interfacing diagram of 8 LEDs and 8 Switches. Interface LEDs to Port 0 and switches to Port 1. Develop an ALP to read status of switches and send it to LEDs.

b) Develop a program to add string of 10 bytes stored at 2000H onwards. Assume result is 16 bits. Store the result at 4000H and 4001H.

c) Explain different factors to be considered while selecting microcontroller for certain application.

6. Attempt any TWO of the following: **12**

a) Draw interfacing diagram of traffic light controlling and write an ALP for the same.

b) State and Explain different development tools used in microcontroller.

c) Develop an ALP to toggle the LEDs after 500 msec. connected to Port 1 after receiving the interrupt INTO.