22426

21222

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

15 minutes extra for each hour

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) State function of $\overline{\text{PSEN}}$ and $\overline{\text{EA}}$ pins of 8051 microcontroller.

b) State maximum size of external memory that can be interfaced with 8051 μc. Explain it.

c) Define stack. Write size of stack pointer.

d) Draw format of IE and IP SFRS.

e) Define the term bus. Write size of buses in 8051 μc.

f) Draw interfacing diagram of relay connected to P2.1 of 8051 μc.

g) Give different applications of stepper motor.

Marks

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

a) Draw a interfacing diagram of traffic light controller with 8051.

b) Compare Microprocessor and Microcontroller.

c) Draw format of PCON SFR. State use of SMOD bit.

d) Draw interfacing diagram of LCD display with 8051. Write function of RS and Enable pins.

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

a) Explain power saving modes of 8051 μc.

b) List any four addressing modes with suitable example.

c) Describe the function of following instructions of 8051.

i) SWAP A

ii) MOVC A, @ DPTR

iii) ADD A @ Ro

iv) INC @ Ro

d) Draw internal structure of Port 1 and explain it.

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

a) Develop a program to generate square wave on P2.7 of 8051 using software delay.

b) Compare Harvard and Vonneuman Architecture.

c) Draw the interfacing diagram of stepper motor with 8051 microcontroller. Write an ALP to rotate a stepper motor counter clockwise by 360°.

d) Draw the interfacing diagram of DAC with 8051 microcontroller. Write an ALP to generate a square waveform.

e) Write an ALP to generate 1 ms delay. Use Timer 0, mode 1. Fosc = 12 MHz.

Marks

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

a) Sketch memory organization of 8051 and label it showing register banks, bit addressable locations SFR area, external data and code memory.

b) Write an ALP to find smallest no. from given array of 10 bytes in external RAM 3000h onward.

c) Draw the interfacing diagram of ADC with 8051 microcontroller.

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

a) Develop an ALP to read temperature from LM35 sensor. Draw interfacing diagram with 8051.

b) Write an ALP to transmit 'YES' on TXD.
Fosc = 11.0592 MHz and Baud Rate = 9600 bps.

c) Draw software development cycle and write function of it's components.