17626

21415

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 THREE of the following:** **12**

(i) Draw the format of PSW. Explain the function of each bit.

(ii) List various branching instructions in micorcontroller 8051.

(iii) State various software tools available in IDE. Explain any one in brief.

(iv) What is deadlock? How can it be prevented?

Marks

b) **Attempt any ONE of the following:** **6**

(i) Write 8051 program in assambly or C to send message 'INDIA' serially. Assume baud rate as 9600 and crystal frequency as 11.0952 MHz.

(ii) Draw the labelled diagram to interface stepper motor to port 1 of 8051. Write assambly or 'C' language program to rotate the motor in clockwise direction continuously.

2. Attempt any FOUR of the following: **16**

a) State the salient features of microcontroller 8051.

b) State various addressing modes available in 8051, with two examples each.

c) List the alternate functions of 8051 port 3 pins. Also write the instruction to set all the port 1 pins as input.

d) Draw the labelled diagram to interface 16 × 2 LCD to microcontroller 8051.

e) State various advantages and disadvantages of embedded system.

f) What is task in an embedded system? What are various states of a task?

3. Attempt any FOUR of the following: **16**

a) Draw and explain the RAM structure of 8051.

b) Describe any four assambler directives used in assambly language programming.

c) Draw the structure of port 0 of 8051. Also state the need of pull up resistors.

Marks

d) Draw the labelled diagram to interface switch to P1.0 and seven segment display to port 2 of 8051.

e) Explain the terms:

(i) Device driver

(ii) In circuit imulator

f) What is task synchronization? How is it achieved?

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

(i) Explain various power saving modes of microcontroller 8051.

(ii) Explain the following 8051 instructions:

1) SETB C

2) SWAP A

3) MOV 80h, 90h

4) MUL AB

(iii) Write a program in assambly language or C to generate square wave of 10 KHz on pin P2.7 of 8051 using timer 0.

(iv) Draw labelled diagram to interface analog to digital converter ADC0808 to 8051.

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) Draw the block diagram of embedded system. Explain various hardware units.

(ii) Explain the features of RTOS. State how it differs from general operating system.

Marks

5. Attempt any FOUR of the following: **16**

a) Draw the format of TMOD SFR. Explain the function of each bit.

b) Explain step by step procedure to execute a program using any cross compiler like KEIL.

c) Draw the format of IE SFR. Explain the function of each bit. Write an instruction to enable only timer interrupt.

d) Draw the diagram to interface D to A converter DAC 0808 to 8051. Write the program in assambly or C to generate ramp wave.

e) State various steps in software development cycle of an embedded system.

f) What is intertask communication? State various mechanisms to achieve it.

6. Attempt any FOUR of the following: **16**

a) State various interrupts available in 8051 alongwith their priority and vector locations. Also list various SFRS associated with interrupt related operation.

b) Write a program using assambly language or 'C' to read data from port 0 and port 1. Multiply the data received send the result on port 2 and port 3 respectively.

c) Write a program to toggle the LED connected to P1.7 on every occurance of external interrupt INTO.

d) Draw labelled diagram to interface 4×4 keyboard to 8051.

e) Explain in brief:

(i) Device programmer

(ii) Target board

f) Describe starvation with example.