17626

11819

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : *(1)* ***All*** *questions are* ***compulsory****.*

(2) Illustrate your answers with neat sketches ***wherever*** *necessary.*

(3) Figures to the ***right*** *indicate* ***full*** *marks.*

(4) Assume suitable data, if ***necessary****.*

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

(6) Mobile Phone, Pager and any other Electronic Communication devices are ***not*** *permissible in Examination Hall.*

Marks

1. Attempt **any five** of the following : **20**

i) Draw the format of PSW. State the function of each bit. **4**

ii) List various branching instruction in microcontroller 8051. (any four) **4**

iii) Draw the format of SCON register and state the function of each bit. **4**

iv) Draw and describe system on chip. **4**

v) What is deadlock ? How it can be prevented ? **4**

vi) State various advantages and disadvantages of an embedded system. **4**

vii) Write a program in assembly or C language to generate a square wave of 10 kHz on pin P2.7 of 8051 using Timer 0. Assume suitable mode. Crystal frequency = 11.0592 MHz. **4**

P.T.O.

Marks

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

i) State the salient feature of 8051 μC (any four). **4**

ii) Explain the following instruction of 8051 μC : **4**

i) SWAP A

ii) MOVC A, @ A + DPTR

iii) RRC A

iv) RETI.

iii) Draw the format of IE SFR. Explain function of each bit. Write an instruction to enable only interrupt of timer '1'. **4**

iv) What do you mean by device driver ? Why it is necessary ? **4**

v) Describe mutual exclusion in RTOS. **4**

vi) Describe use of shared memory in interprocess communication. **4**

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

i) List various addressing modes of 8051 microcontroller along with one example of each. **4**

ii) State various interrupts available in 8051 along with their priority and vector locations and SFR associated with these interrupts. **4**

iii) Draw the pin diagram of 16 × 2 LCD display and state the function of following pins : **4**

1) RS

2) R/W

3) Busy.

iv) State various software tools available in IDE. Explain any one in brief. **4**

v) Describe the starvation in RTOS. **4**

vi) Indicate which timer and mode is selected for each of the following instruction :

i) MOV TMOD, #01H

ii) MOV TMOD, #12H. **4**

4. Attempt **any four** of the following : **16**

i) Describe any four assembler directives used in assembly language programming. **4**

ii) Explain various power saving options of microcontroller 8051. **4**

iii) State the function of : **4**

i) Device programmer

ii) Target board.

Marks

iv) Write a program to toggle LED connected to P1.7 on every occurrence of external interrupt INTO. **4**

v) Draw the interfacing of 4 × 4 keyboard with 8051 μC. **4**

vi) What is task in an embedded system ? What are various states of a task ? **4**

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

i) What is task synchronization ? How is it achieved ? **4**

ii) Explain step by step procedure to execute a program using any cross compiler. **4**

iii) Draw the format of TMOD register of 8051 microcontroller and state function of each bit. **4**

iv) Draw the labelled architecture of 8051 μC. **4**

v) Draw the interfacing 7-segment multiplexed display with 8051 microcontroller. **4**

vi) Explain the features of RTOS. State how it differs from general operating system. **4**

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

i) Draw the block diagram of embedded system and describe the hardware units of an embedded system. **4**

ii) Write a program to send "MSBTE" serially at 9600 baud rate continuously using assembly or C. **4**

iii) List alternative functions of 8051 port 3 pins. Also write the instructions to set all the port 1 pins as input. **4**

iv) Draw the interfacing diagram of ADC with 8051 microcontroller. **4**

v) Draw the labelled architecture of 8051 μC. **4**

vi) Write an assembly language program for the 8051 microcontroller to multiply two 8-bit numbers stored at memory location 20 H and 21 H. Store the multiplication at 22 H and 23 H. **4**
