17626

21718

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. a) Attempt **any three** of the following : **12**

i) Explain the following pins of 8051 microcontroller.

a) $\overline{\text{PSEN}}$ b) ALE c) $\overline{\text{EA}}$ d) RESET

ii) State the purpose of the following branch instructions in 8051 microcontroller.

a) AJMP add b) LJMP add c) SJMP add d) JC Label

iii) Draw the PSW register and explain each bit in detail.

iv) Explain power saving operation of 8051 microcontroller.

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

i) Draw interfacing diagram of ADC with 8051 microcontroller. Write assembly or C language program to convert analog input data into digital using ADC for 8051.

ii) Describe the concept of multitasking in RTOS.

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

a) Explain the following instructions and what will be the content of Register A and B after the execution of following instructions ?

```
MOV A, # 38 H
ADD A, # 54 H
DA A
MOV B, A
```

b) Explain the assembler directives.

i) DB ii) ORG iii) EQU iv) END

c) Explain the following instructions of 8051 microcontroller.

i) XCH A, RI ii) ADD A, 40 H iii) DJNZ R_n, add iv) ADD A, # 40 H

d) What is a dead lock ? How it can be prevented ?

e) State any eight features of 8051 micro controller.

f) List the alternate functions of 8051 port 3 pins.

P.T.O.

Marks

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

a) Draw neat labelled diagram to interface 16 × 2 LCD with 8051 and explain.

b) Draw the structure of PORT 0 of 8051. Why pull up resistors are required here ?

c) Write a program in assembly or C language to generate a square wave of 10 KHz on pin P2.4 of 8051 using timer 0.

d) Explain the features of RTOS. How it differ from general operating system ?

e) State any eight applications of embedded system.

f) Explain with example what do you mean by share data problem ? How it is avoided ?

4. a) Attempt **any three** : **12**

i) With neat sketch explain the interfacing of seven segment display with 8051 microcontroller.

ii) Explain various debugging tools used in embedded system.

iii) State four features of embedded system.

iv) State the difference between microcontroller and microprocessor (any four).

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

i) Draw interfacing diagram of stepper motor with 8051 microcontroller. Write ALP to rotate stepper motor in anti clockwise direction continuously using full step sequence.

ii) Explain with diagram four timer modes in 8051.

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

a) Draw and describe IE SFR of 8051.

b) Write ALP to move 10 bytes of data from internal RAM memory address 40 H to internal RAM located from 50 H as starting address.

c) Write a program for serial data transfer. "G" at 9600 baud rate continuously.

d) Describe the concept of device driver in embedded system.

e) Draw interfacing diagram of 4 × 4 matrix keyboard with 8051 microcontroller.

f) Describe the concept of SOC in embedded system.

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

a) Explain the terms :

i) In circuit emulator

ii) Target board.

b) What is intertask communication ? State the various mechanism to achieve it.

c) Draw the format of TCON and TMOD register and label each bit.

d) What is task synchronization ? Explain in brief.

e) Describe steps in embedded software development cycle.

f) Write assembly or C language program to take data from P2 and P3. EX-OR this received data and send result on P1 of microcontroller.

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