17534

14115

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****.*

MARKS

1. A) Attempt **any three** : **12**

i) What is bus ? Describe the different types of buses used in 8051 microcontroller.

ii) State the difference between Harvard and Von-Neumann architectures with suitable diagram.

iii) Draw the format of PSW register of 8051 microcontroller and explain the function of any two flags.

iv) With the help of ADD instruction, explain :

a) Direct addressing mode

b) Indirect addressing mode

c) Register addressing mode

d) Immediate addressing mode.

v) Draw the interfacing diagram of 4K bytes of RAM and 4K bytes of EPROM to 8051 microcontroller.

B) Attempt **any one** : **6**

i) Write an assembly language program for 8051 microcontroller to add five 8-bit numbers stored in internal RAM from 20H onwards. Store the result at 30H.

ii) Draw the interfacing diagram of seven segment display to 8051 microcontroller. Write an assembly language program to display ‘g’ on seven segment display.

P.T.O.

MARKS

2. Attempt **any four** : **16**

   a) Draw the internal RAM memory organisation of 8051 microcontroller.

   b) Describe the power saving modes of 8051 microcontroller.

   c) State any four important features of 8051 microcontroller.

   d) Compare 8031, 8051 and 8751 (any four points).

   e) Draw the block diagram of 8051 microcontroller.

   f) Distinguish between microprocessor and microcontroller (any four points).

3. Attempt **any four** : **16**

   a) Describe the function of editor, assembler, complier and linker.

   b) Write an assembly language program to transfer five bytes from source block to destination block. Assume source block address is 10H and destination block address is 20H.

   c) Describe the function of following instructions of 8051 microcontroller.
      i) MOV X A, DPTR
      ii) SWAP A
      iii) MUL AB
      iv) MOV A, RO

   d) Draw the block diagram of 8255.

   e) Draw the format of SCON register of 8051 microcontroller and explain the function of each bit.

4. a) Attempt **any three** : **12**
      i) With the help of suitable diagram describe the serial communication modes of 8051 microcontroller.
      ii) Draw the format of PCON register of 8051 microcontroller and describe the function of each bit.

MARKS

iii) Write an assembly language program to send message 'WELCOME' serially at 9600 baud rate continuously.

iv) Write an assembly language program to multiply two 8-bit numbers stored in internal RAM locations 10H and 11H. Store the result at 12H and 13H.

b) Attempt **any one** : **6**

i) Draw the interfacing diagram of 8 LEDs to port 2 of 8051 microcontroller. Write an assembly language program to make LED ON and OFF after certain delay.

ii) Write an assembly language program to find largest number out of ten numbers stored in internal RAM locations 40H onwards, store the result at 50H.

5. Attempt **any four** : **16**

a) Draw the format of IE register of 8051 microcontroller and describe the function of each bit.

b) With the help of neat diagram describe the timer modes of 8051 microcontroller.

c) Write an assembly language program for 8051 microcontroller to generate a square wave of 1 KHz on P1.5. Assume crystal frequency is 11.0592 MHz.

d) Write an assembly language program for 8051 microcontroller to receive 10 bytes of data serially and save them in accumulator. Assume baud rate is 4800.

e) List the I/O ports of 8051 microcontroller and describe alternative functions of ports.

MARKS

6. Attempt **any four** : **16**

a) Draw the format of TCON register of 8051 microcontroller and state the functions of each bit.

b) List the priority of interrupts of 8051 microcontroller with respective interrupt destinations.

c) Draw the interfacing of stepper motor with 8051 microcontroller.

d) Write an assembly language program for 8051 microcontroller to turn ON LED connected to P1.7 pin on the occurrence of INTO and turn OFF LED after some delay.

e) Describe any four selection factors of microcontroller.
