



17509

15116

3 Hours / 100 Marks

Seat No.

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- 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.*

Marks

1. A) Attempt **any three** : **12**
- i) Draw the block diagram of Von-Neumann and Harvard architectures.
 - ii) Draw the interfacing of two seven segment display with 8051 microcontroller.
 - iii) Write C language program for 8051 microcontroller to toggle all 8 lines of port 0 with delay.
 - iv) Describe the function of PC and DPTR.
- B) Attempt **any one** : **6**
- i) Draw and describe the internal RAM memory organisation of 8051 microcontroller.
 - ii) Write an assembly language program to find largest number out of five numbers. Data is stored in internal RAM memory location 10 H onwards. Store the result at 20 H.
2. Attempt **any two** : **16**
- a) Describe the addressing modes of 8051 microcontroller with one example.
 - b) Draw the interfacing of DAC 0808 with 8051 microcontroller. Write C language program to generate triangular waveform by using DAC 0808.
 - c) Draw the interfacing of stepper motor with 8051 microcontroller. Draw a flow chart to rotate stepper motor through 360° in Anticlock wise direction.
3. Attempt **any four** : **16**
- a) Draw the block diagram of internal architecture of 8051 microcontroller.
 - b) Describe the four timer modes of 8051 microcontroller with suitable diagram.
 - c) Write C language program for 8051 microcontroller to read data from port 1 and send it to port 3.
 - d) Distinguish between microprocessor and microcontroller (any four points).
 - e) Draw the interfacing of 8 LEDs to port 2 of 8051 microcontroller. Write C language program to turn ON and OFF LEDs of port 2 with delay.

P.T.O.

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

- i) Draw the interfacing of relay and optoisolator with 8051 microcontroller.
- ii) What is bus ? Describe the function of address, data and control bus.
- iii) Write the instruction for following using C operator :
 - a) Bit wise shift data left 4 times.
 - b) Bit wise shift data right 4 times.
- iv) Draw the format of PSW register of 8051 microcontroller and describe the function of any two flags.

B) Attempt any one :**6**

- i) Write an assembly language program for 8051 microcontroller to find average of ten 8-bit numbers stored in internal RAM location 20 H onwards. Store the result at 30 H.
- ii) Draw the format of TMOD register of 8051 microcontroller. Describe the function of each bit.

5. Attempt any two :**16**

- a) Draw the interfacing of ADC 0809 with 8051 microcontroller. Write C language program to read the data at channel 0 of ADC 0809 and store it to 10 H memory location.
- b) Describe the following assembler directives with example.
 - i) DB
 - ii) ORG
 - iii) EQU
 - iv) END.
- c)
 - i) Write C language program for 8051 microcontroller to add five 8-bit numbers.
 - ii) State any four C data types with their range of value.

6. Attempt any four :**16**

- a) Distinguish between 8051 and 8052 microcontrollers (any four points).
 - b) Write C language program for 8051 microcontroller to transmit message 'WELCOME' serially at baud rate 9600, 8-bit data, 1-stop bit. Assume crystal frequency is 11.0592 MHz.
 - c) Write an assembly language program for 8051 microcontroller to transfer 10 bytes starting from 20 H onwards to 30 H onwards.
 - d) Describe alternative functions of port 3 of 8051 microcontroller.
 - e) Draw the interfacing diagram for temperature measurement using 8051 microcontroller and ADC 0809.
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