

22426

12425

3 Hours / 70 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. Attempt any FIVE of the following :**

**10**

- (a) Define the term Bus. State different types of Buses in 8051.
- (b) Specify the size of internal RAM & ROM in 8051 Microcontroller.
- (c) List addressing modes of 8051.
- (d) Compare Timer & Counter on the basis of mode of operation.
- (e) Draw interfacing diagram of  $4 \times 4$  matrix keyboard with 8051 microcontroller.
- (f) Give the different applications of Stepper motor.
- (g) Draw the format of TMOD Register.

**2. Attempt any THREE of the following :**

**12**

- (a) Draw the interfacing of Stepper motor & write an ALP to rotate in anti-clockwise direction.
- (b) Draw the pin diagram of 8051.
- (c) Draw & explain the format of PSW register.
- (d) Draw & explain TCON Register format.



- 3. Attempt any THREE of the following :** **12**
- (a) List out the features of 8051. (Any 8 points)
  - (b) State & explain development tools of microcontroller. (Any 4)
  - (c) State the operation of Boolean processor.
  - (d) Draw the format of IE & IP SFRs.
- 4. Attempt any THREE of the following :** **12**
- (a) Write an ALP to generate square waveform using DAC.
  - (b) Compare Microprocessor & Microcontroller. (8 points)
  - (c) Sketch interfacing diagram of 4 KB RAM & 4 KB EPROM to 8051. Draw the memory map.
  - (d) Develop an ALP to generate square wave of 2 kHz on port pin P1.5. Generate delay using timer 0 mode 1 of operation. Assume crystal frequency of 11.0592 MHz.
  - (e) Develop an ALP to transmit message “Microcontroller” serially at baud rate of 9600, 8 bit data, 1 stop bit. Assume crystal frequency of 11.0592 MHz.
- 5. Attempt any TWO of the following :** **12**
- (a) Explain the various selection factors of microcontroller suitable for application.
  - (b) Develop an ALP to transfer a block of 10 numbers from Internal memory location 30H to 40H.
  - (c) Sketch 8051 interfacing diagram to interface 4 LEDs & 4 switches. Interface LED to port 0 and switches to port 1. Develop an ALP to read status of switches & operate LED as per switch status.
- 6. Attempt any TWO of the following :** **12**
- (a) Develop an ALP to read temperature from LM35 sensor. Draw the interfacing diagram with 8051.
  - (b) Develop a program to toggle the LEDs after every 500 m sec connected to P1.0 & P1.1 after receiving the external interrupt on INTO.
  - (c) Draw & explain software development life-cycle of microcontroller.
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