

314328

24225

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Figures to the right indicate full marks.
 - (4) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE out of SEVEN :

5 × 2 = 10

- (a) List the features of 8051 Microcontroller (any four).
- (b) Define the term stack. Write size of stack pointer.
- (c) List addressing mode of 8051 microcontroller (any four).
- (d) Draw interfacing diagram of relay connected to P2.1 of 8051 microcontroller.
- (e) State the function of $\overline{\text{PSEN}}$ & $\overline{\text{EA}}$ pins of 8051 microcontroller.
- (f) Draw interfacing diagram of 4 * 4 key matrix with 8051 microcontroller.
- (g) Draw the format of TCON register.

2. Attempt any THREE out of FOUR :

3 × 4 = 12

- (a) With the help of ADD instruction, explain :
 - (i) Direct Addressing Mode
 - (ii) Indirect Addressing Mode
 - (iii) Register Addressing Mode
 - (iv) Immediate Addressing Mode



- (b) Explain the interrupt mechanism with the help of suitable example.
- (c) Write a program to generate a square wave of 1 kHz at P 1.5 pin of 8051 microcontroller assume 12 MHz crystal frequency.
- (d) Draw interfacing diagram of 4K byte EPROM & 4K byte RAM to 8051 microcontroller. Draw memory map.

3. Attempt any THREE out of FOUR :

3 × 4 = 12

- (a) Compare Von-Neuman and Harvard architecture (four points).
- (b) With the help of neat diagram, explain the Timer mode 0 of 8051 Microcontroller.
- (c) Write a program to display 'g' on seven segment display.
- (d) Write a program to find the sum of data stored at five consecutive memory location starting from 40 H.

4. Attempt any THREE out of FIVE :

3 × 4 = 12

- (a) Draw the block diagram of Microcontroller and write functions of each block.
- (b) Describe 8051 microcontroller instruction with example :
 - (i) LJMP addr.
 - (ii) SETB <bit>
 - (iii) MOVX A,@DPTR
 - (iv) XCHDA,<byte>
- (c) Draw the format of TMOD time mode register and state the function of each bit.
- (d) Compare absolute decoding and linear decoding related to memory interfacing.
- (e) Write assembly language program generate triangular wave form DAC 0808.

5. Attempt any TWO out of THREE :**2 × 6 = 12**

- (a) (i) List 8051 special function registers.
- (ii) Explain and draw PSW register.
- (b) Write assembly language program to generate a stair step voltage from DAC 0808 with stair step voltage from 0 V through 5 V, with resolution 0.5 v each step. Using look up table. Assume $V_{ref} = 5\text{ v}$, $R1 = 5\text{k}$ and $Rf = 5\text{k}$.
- (c) Draw interfacing of 2k byte EPROM and 2K byte RAM to 8051 microcontroller. Draw memory map.

6. Attempt any TWO out of THREE :**2 × 6 = 12**

- (a) (i) List various interprets in 8051 microcontroller.
 - (ii) Draw and explain IE Register.
 - (b) Draw the interfacing diagram of 7 segment display to 8051 microcontroller.
 - (c) Draw the interfacing diagram of stepper motor with 8051 microcontroller. Write an assembly language program to rotate motor continuously in clockwise direction.
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