

22426

22232

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Attempt **All** questions including Question No. 1 which is compulsory.
 - (3) Answer each Section on same / separate answer sheet.
 - (4) Answer each next main Question on a new page.
 - (5) Illustrate your answers with neat sketches wherever necessary.
 - (6) Figures to the right indicate full marks.
 - (7) Assume suitable data, if necessary.
 - (8) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (9) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following :

5 × 2 = 10

- (a) State two points of comparison between microcontroller & microprocessor with respect to Memory, I/O ports.
- (b) State the pins on ADC 0808/09 used for handshaking with the microcontroller 8051.
- (c) State the function of following directives (1) DB (2) EQU
- (d) State the use of GATE bit in TMOD SFR format, in 8051 microcontroller.
- (e) State the use of Boolean processor of 8051 microcontroller with one example.

- (f) State the necessity of External memory interfacing with 8051 microcontroller. State the status of EA pin during external memory access.
- (g) Write an Assembly language program to generate square wave on Port Pin P 1.5 of 8051 microcontroller using Timer 0 in mode 1. Assume clock frequency as 12 MHz.

2. Attempt any THREE of the following :

3 × 4 = 12

- (a) With neat labelled interfacing diagram, explain the working of water level controller using 8051 microcontroller.
- (b) Compare Harvard and Von-neumann architecture. (Any four points of comparison)
- (c) Write a program in Assembly language for 8051 to transfer data “A” serially at 4800 baud rate continuously. (Assume suitable data)
- (d) Draw interfacing diagram of LCD with microcontroller 8051. Explain the function of following pins :
 - (1) RS
 - (2) VEE

3. Attempt any THREE of the following :

3 × 4 = 12

- (a) Explain the power saving options of microcontroller 8051 with suitable diagram.
- (b) Develop an assembly language program for 8051 to add data stored at five consecutive address location starting from 30 H. Store the result at 40 H and carry at 41 H.
- (c) State and explain software development cycle used for application development with microcontroller.
- (d) Draw and explain the configuration & internal structure of Port 1 of 8051 microcontroller.

4. Attempt any THREE of the following : 3 × 4 = 12

- (a) Write an ALP to rotate stepper motor in clockwise direction through 360°. Consider step angle of motor 1.8°/step. Write the sequence used for rotation.
- (b) Compare 8031 & 8052 (Any four points of comparison)
- (c) Draw & explain interfacing diagram of DAC 0808 with microcontroller 8051.
- (d) Write an ALP in 8051 to generate triangular waveform using DAC 0808.
- (e) Write an ALP for 8051 microcontroller to generate a delay of 1m sec. Using timer operation. (Consider clock freq. 12 MHz)

5. Attempt any TWO of the following : 2 × 6 = 12

- (a) Explain the application of stack in microcontroller 8051, with suitable example.
- (b) Write an ALP for 8051 microcontroller, to move a block of data stored at location 40 H to 44 H to location 50 H to 54 H. (Consider suitable data)
- (c) Draw an interfacing diagram of temperature controller, using LM35, & ADC 0808/09 with 8051 microcontroller.
Write an ALP to read the temperature. (consider suitable data)

6. Attempt any TWO of the following : 2 × 6 = 12

- (a) Write an ALP for traffic light controller using microcontroller 8051. Use timers in the 8051 to obtain delay. (Consider suitable data)
 - (b) Draw format of IE register in 8051 microcontroller & write instructions to enable serial interrupt, timer 0 interrupt and external hardware interrupt 1 (EX1)
 - (c) Explain four addressing modes of 8051 microcontroller with suitable examples of each.
-

