22421

21819

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) 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) Construct OR gate using NAND gate.

(b) Compare Harrord and Non-Neuman architecture. (any two points)

(c) Write the excitation table for T-FF.

(d) Define : (i) Address bus (ii) Data bus.

(e) List the different addressing modes of 8051.

(f) Define : (i) Assembler (ii) Compiler

(g) Find the number of address lines required for

(i) 4K RAM (ii) 8K ROM

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

(a) State & explain De-Morgan's first theorem.

(b) Compare microprocessor & microcontroller. (any four points)

(c) Solve the following SOP expressions with the help of K-map :

(i) $F(A, B, C, D) = \Sigma m(0, 1, 3, 4, 5, 7)$

(ii) $F(A, B, C) = \Sigma m(0, 1, 4, 5, 6, 7)$

(d) Write any two laws of Boolean algebra. Justify with the help of truth table.

3. Attempt any THREE of the following : **12**

(a) List any eight features of microcontroller 8051.

(b) Compare TTL, CMOS & ECL families on the following :

(i) Power dissipation

(ii) Noise Margin

(iii) Speed of Operation

(iv) Fan-in

(c) Describe the function of following pins of 8051 :

(i) $\overline{\text{PSEN}}$

(ii) RESET

(iii) ALE

(iv) $\overline{\text{EA}}$

(d) Draw logic diagram of 4 : 1 multiplexer & give it's truth table.

4. Attempt any THREE of the following : **12**

(a) Draw a neat labelled interfacing diagram of 8051 with stepper motor.

(b) Implement OR gate using transistor.

(c) Write the alternative function of Port-3 pins.

(d) Draw master-slave JK FF & write it's truth table.

(e) Explain Boolean processor of 8051.

5. Attempt any TWO of the following : **12**

(a) Execute the following program & specify the contents of Accumulator & status of PSW after execution. Also draw the format of PSW

```
MoV A, #OFH
MoV B, #03H
Div AB
End
```

(b) Develop an ALP to generate square wave of 1kHz at port pin P1.3. Draw flowchart for it.

(c) Explain full adder with it's logic diagram & truth table.

6. Attempt any TWO of the following : **12**

(a) Construct 3-bit synchronous UP counter using flipflop. Also draw it's timing diagram.

(b) Describe the following assembler directives with one example of each :

(i) ORG

(ii) DB

(iii) EQU

(iv) END

(v) CODE

(vi) DATA

(c) Develop an ALP for interfacing of LED's with Port 1 of 8051. Draw interfacing diagram for the same.
