22421

12526

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

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.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

a) Construct NOR gate using NAND gate.

b) Draw the symbol and truth table of X-NOR gate.

c) Define minterm and maxterm.

d) Define demultiplexer and state any two examples.

e) Identity the addressing mode of the following instructions.

i) MOVX@Ro, A

ii) MOV A, #30H

f) State the function of assembler and compiler.

g) Find the number of address line required for –

i) 4K RAM

ii) 8K ROM

P.T.O.

Marks

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

a) State and verify Demorgans first and second theorem with truth table.

b) Compare the TTL, CMOS, ECL logic family on the basis of –

i) Fan-out

ii) Power dissipation

iii) Figure of merit.

iv) Propagation delay

c) Design 16:1 multiplexer using 4:1 multiplexer.

d) Explain 4 bit asynchronous up counter using diagram and truth table.

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

a) Solve the following SOP expression using K-map.

$f(A, B, C, D) = \Sigma m(0, 1, 3, 5, 7, 9)$

b) Compare microprocessor and microcontroller.

c) State and explain assembler directives.

d) Draw the interfacing diagram of 16×2 LCD display.

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

a) State universal gates and explain why these gates are called as universal gates.

b) Explain full adder with neat diagram and truth table.

c) State any 8 features of 8051 microcontroller.

d) Explain power saving modes of 8051 microcontroller.

e) Explain software development cycle.

Marks

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

a) Draw the detailed architecture of 8051. State the function of stack pointer.

b) Develop an ALP to rotate the stepper motor 90° in anticlockwise direction with the neat diagram.

c) Develop an ALF to exchange the ten numbers from internal memory location 20H and 40H with flowchart and algorithm.

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

a) Explain master slave JK Flip Flop with diagram and truth table.

b) Compare Harvard and Von Neumann architecture. (4 points) State the function of address and data bus.

c) Develop an ALP to generate square wave of 2KHz on P3.0. Also draw the flowchart.