22320

12425

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

(7) 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) Write the gray code of given no.

$(11011)_2 = (?)_{Gray}$

b) List the different type of ADC.

c) Draw block diagram of 4:1 multiplexer and write its truth table.

d) State advantages of PLDs.

e) Define following characteristics of logic families.

i) fan in

ii) fan out

f) Draw logic diagram of T flip-flop and give its truth table.

g) Draw symbol of NAND and NOR Gate with its boolean expression.

P.T.O.

Marks

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

a) Perform the following substration using 1's complement method

i) $(48)_{10} - (68)_{10}$

ii) $(1011)_2 - (101)_2$

b) Design a Half subtractor circuit using K-map.

c) Describe the working of 4 bit SISO (Serial in Serial Out) Shift Register with diagram.

d) Draw the circuit for NoT, OR and AND gate using NAND gate only.

e) Minimize the following expression using K-map and Draw the ckt. dig.

$F(A, B, C, D) = \sum m\ (0, 1, 4, 5, 6, 7, 13, 15)$

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

a) Simplify the following Boolean expression using Boolean laws.

$y = \overline{AB} + \overline{A}C + B\overline{C}$

b) Realize the following function using Demultiplexer.

$Y_1 = \sum m\ (1, 2, 7, 9, 12, 14)$

$Y_2 = \pi M\ (3, 5, 8, 11, 15)$

c) Compare between PLA and PAL.

d) Describe the working of clocked JK flip-flop with its truth table and logic diagram.

e) Draw the block diagram of BCD to seven segment decoder using IC 7447 with truth table of it.

Marks

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

a) Draw 8 : 1 multiplexer using to 4 : 1 multiplexer.

b) Draw the block diagram explain the working of 3 bit asynchronous counter with waveform.

c) Compare the following (Any three point)

i) SRAM with DRAM memory.

ii) Mux and Demux.

d) State and prove De-morgan's Theorems. (Any one)

e) What are BCD numbers ? Perform BCD addition for the following

i) $(68)_{10} + (44)_{10}$

ii) $(50)_{10} + (36)_{10}$

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

a) Convert the following into std. forms.

i) $y = \overline{A}B + ABC + \overline{B}C$

ii) $y = \overline{B}C + AB$

iii) $y = (A + B) \cdot (\overline{B} + \overline{C})$

b) Compare the parameters of TTL, ECL and CMOS logic families (Any four points)

c) Design a Mod-6 asynchronous counter with truth table and logic.

Marks

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

a) Find the Boolean expression for logic circuit given in Fig. No. 1 and reduce it using Boolean algebra.

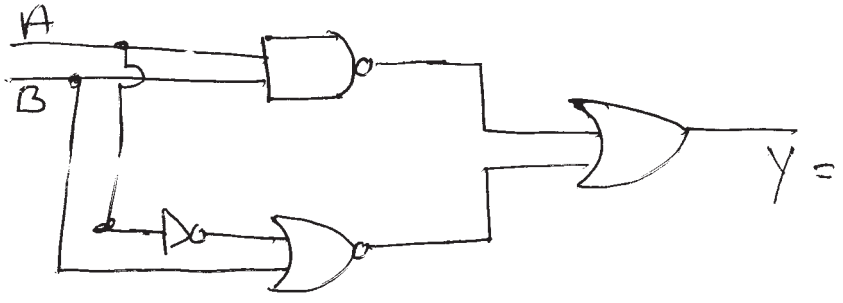

Fig. No. 1

b) Draw the circuit diagram of 4 bit R-2R Ladder DAC and obtain its output voltage expression.

c) Explain the working of 3 bit synchronous counter with circuit diagram.