22320

12223

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) 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 radix of binary, octal, hexadecimal number system.

b) State necessity of demultiplexer.

c) Draw symbol and write the truthtable for T-flipflop.

d) Compare between synchronous and asynchronous counter.

e) Write gray code to given number $(11111)_2 = (?)_{Gray}$

f) State two features of ADC IC0809.

g) Draw four variable K-map.

P.T.O.

Marks

2. Attempt any THREE of the following : 12

a) Sketch the given Boolean expression; use one AND gate one OR gate only Y = AB + AC.

b) Draw circuit diagram of BCD to seven segment decoder and write its truth table.

c) Draw the block diagram of programmable array logic.

d) Minimize following expression using K-map.

$f(A,B,C,D) = \Sigma m\,(1,5,6,7,11,12,13,15)$

3. Attempt any THREE of the following : 12

a) Realize the following logic operation using only NOR gates : AND, OR, NOT.

b) Describe the operation of 4 bit serial in serial out shift register.

c) Calculate the analog output of 4 bit DAC if the digital input is 1101. Assume $V_{FS} = 5V$

d) Describe the working of SR flipflop with its truth table and logic diagram.

4. Attempt any THREE of the following : 12

a) Draw symbol, truth table and logical output equation of OR and EX-OR gate.

b) Describe function of full adder circuit with its truth table and logical diagram.

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

d) Describe working of Master-slave JK flipflop with truth table and logic diagram.

e) Compare between R-2R ladder DAC and weighted resistor DAC (Four points).

Marks

5. Attempt any TWO of the following : 12

a) Explain 3 bit asynchronous counter with output waveforms.

b) Compare following (Any three points)

i) RAM with ROM memory.

ii) EPROM with EEPROM memory.

c) Convert the following.

i) $(6AC)_{16} = (?)_{10}$

ii) $(2003)_{10} = (?)_{16}$

iii) $(228)_{10} = (?)_{BCD}$

6. Attempt any TWO of the following : 12

a) Give the block schematic of decade counter IC 7490. Design mod-7 counter using IC.

b) Design a four bit BCD adder using IC-7483 and NAND gate only.

c) Draw the circuit and explain the principle of TTL gate with totempole output

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