

L-①

Seat Number :- _____

Duration: 2.5 Hrs.

G312NDLA

Marks:- 75

- Note:-
- 1) All questions are compulsory
 - 2) All questions carry equal marks
 - 3) Figures to the right indicate maximum marks.

Q.1) Attempt Any 3

(15 M)

- 1) $(17E.F6)_{16} = (?)_2$ Convert the number
- 2) $(110010100011.10100)_2 = (?)_{16}$ convert the number
- 3) Convert the given.
 - 1) $(125.50)_{16} = (?)_2$
 - 2) $(110001)_2 = (?)_{10}$
- 4) Convert the following.
 - 1) $(1051.36)_{10} = (?)_8$
 - 2) $(FgA.D5)_{16} = (?)_{10}$
- 5) Obtain the 2's complement of $(10110010)_2$.
- 6) Convert hex number $(68.4B)_{16}$ into equivalent octal number

Q.2) Attempt any 3

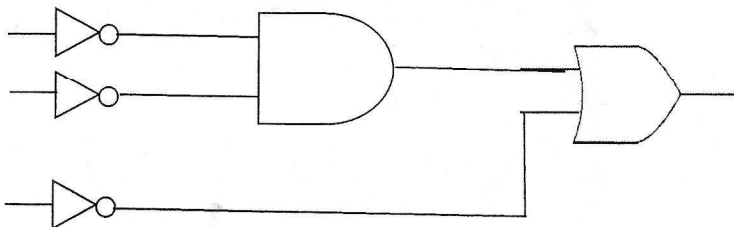
(15 M)

- 1) Explain the Ex-Or gate Specify its symbol and write its truth table.
- 2) Write comparison between encoder and decoder
- 3) Give the circuit diagram 1:8 Demux using tree of 1:4 Demux.
- 4) Draw the symbol & truth table for
 - 1) Ex-Or gate
 - 2) Nor gate.
- 5) Write the truth table of following
 1. Three input AND gate
 2. Three input NAND gate
- 6) Explain with circuit diagrams a two input Ex-Nor gate using only NAND gates.

Q.3) Attempt Any 3 :-

(15 M)

- 1) Write the Boolean expression for the logic circuit shown in figure.



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2) Draw logic circuit and make truth table to prove the following Boolean theorem.

$$(A * B) * C = A * (B * C).$$

3) Simplify following Boolean function in SOP form using K-map and implement using logic gates. $F(A,B,C,D) = \sum m(0,2,6,10,11,12,13) + d(3,4,5,14,15)$

4) Derive the POS of the following expression using K-maps & draw the logical diagram

$$F(A,B,C,D) = \pi m(0,2,3,4,8,12)$$

5) Simplify using K-map and realize it using minimum number of gates

$$F(A,B,C,D) = \pi m(4,6,8,9,10,12,13,14) + d(0,2,5)$$

6) Draw the structure of four variable K-map to represent the standard to POS form.

Q.4) Attempt Any 3:-

(15 M)

- 1) What is a combinational circuit? Build a combination circuit of a half adder.
- 2) With the help of circuit diagram discuss four bit binary adder - subtractor
- 3) What is comparator circuit? Discuss its detail working.
- 4) Draw the logic diagram of 4:1 multiplexer. Explain its working with truth table
- 5) Design 16:1 multiplexer using 8:1 multiplexer
- 6) Write comparison of multiplexer and demultiplexer.

Q.5) Attempt Any 3 :-

(15 M)

- 1) Draw the logical circuit diagram and describe the working of a 4:2 encoder.
- 2) Write comparison between synchronous and asynchronous counters
- 3) Convert $(3000.45)_{10}$ into its equivalent binary number.
- 4) Convert $(364.25)_8$ into its equivalent binary number.
- 5) What is two's complement number?
- 6) Describe the hexadecimal system.

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