

SIC No.-

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Duration: 01:30

Total No. of Pages:-01

Full Marks: 25

1 Answer All

- a Convert $(1375)_8 = (?)_2 = (?)_{10}$ 1
- b Applying DeMorgan's theorem to the expression $\overline{(\overline{X + Y}) + \overline{Z}}$, we get _____. 1
- c How many minimum number of 2 input NAND and NOR gates are required to realize 2 input EX-OR gate? 1
- d Convert Binary code 1011001 to Gray code 1
- e Find the Excess-3 code for the given binary code $(0110)_2$ 1
- f Add 59 & 39 using BCD addition. 1

2 Answer All

- a Express the decimal number -75 as an 8-bit number in the sign-magnitude, signed 1's complement, and signed 2's complement forms 3
- b Using Boolean theorem, simplify the expression $Y = ABC'D' + A'BC'D' + A'BCD' + ABCD'$
Also mention the theorem used in each step. 3
- c $F = A' + AC' + AB'C + B'C$ 3
- (i) Express in sum of minterms
- (ii) Express in Canonical POS

3 Answer any One

- a Reduce the expression using boolean algebra and implement using NOR gates only
 $f = A + B [AC + (B + C')D]$ 5
- b Perform the following operations using 2's complement method for $X=33$ and $Y=45$ 5
- (i) $X-Y$ (ii) $Y-X$

4 Answer any One

- a $F = \sum_m(0,2,3,6,7) + \sum_d(8,10,11,15)$. 5
- Simplify the given Boolean function using KMAP and implement using basic logic gates.
- b After discovering the truth table, design a full adder circuit using logic gates by finding the expressions for the output. Use KMap whenever necessary. Show the full adder as a combination of half-adders and some logic gates. 5