Tut.	Type	Tutorial
1	-	Logic Exam (Quantitative Aptitude and Reasoning)
Unit : I – Fundamentals of Digital System		
2	A	Q-1 Perform the Following 1. $(32.15)_{10} = (\ )_2$ 2. $(11011.101)_2 = (\ )_{10}$ 3. $(378.93)_{10} = (\ )_8$ 4. $(4057.06)_8 = (\ )_{10}$ 5. $(2598.675)_{10} = (\ )_{16}$ 6. $(110101.101010)_2 = (\ )_8$ 7. $(A0F9.0EB)_{16} = (\ )_{10}$ 8. $(367.52)_8 = (\ )_2$ 9. $(01011111011.011111)_2=(\ )_{16}$ 10. $(3A9E.B0D)_{16} = (\ )_2$ 11. $(756.603)_8 = (\ )_{16}$ 12. $(B9F.AE)_{16} = (\ )_8$
	B	Q-2 Given that $(4096)_{10} = (1000)_x$, Find the value of x.
	A	Q-3 Convert the decimal number 250.5 to base 3, base 4, base 7 & base 8.
	C	Q-4 Covert Number $(4433)_5$ to Base 10 and Base 2.
	C	Q-5 Convert the decimal number $(2598.675)_{10}$ to Base 2, Base 4, Base 8, Base 16.
3	B	Q-1 Convert $(33.45)_{10}$ to binary. Result should be accurate to within $(0.01)_{10}$.
	B	Q-2 Convert $(99.99)_{10}$ to Octal. Result should be accurate to within $(0.02)_{10}$.
	C	Q-3 Perform the following for Octal numbers. 1. 26.5 * 2.5 2. Divide 153.6 by 7
	C	Q-4 Perform the following for Hexadecimal numbers. 1. 92.5 X B.3 2. Divide 6ABF.6D by 1A
	B	Q-5 Perform the following; 1. $(-128)_{10} = (?)_2$ 2. $(-1)_{10} = (?)_2$ 3. $(-39.79)_{10} = (?)_2$ 4. $(-49.02)_{10} = (?)_2$
	C	Q-6 Find the value of X. 1. $\sqrt{(61)_x} = (7)_{10}$ 2. $\sqrt{(144)_x} = (18)_{10}$

4	B	Q-1 Find the 10's complement of the following. 1. $(935)_{11}$ 2. $(6106)_{10}$
	B	Q-2 Add $(6E)_{16}$ and $(C5)_{16}$
	A	Q-3 Subtract $(45)_8$ from $(66)_8$
	A	Q-4 Perform the following subtraction using 2's complement method: $(11010)_2$ - $(10000)_2$
	B	Q-5 Convert $(1000\ 0110)_{BCD}$ to Decimal, Binary & Octal.
	C	Q-6 Convert $(96)_{10}$ into Gray code.
	A	Q-7 Find the XS-3 code of 37.
	B	Q-8 Perform the following in BCD: 1. 308 + 789 2. 205.7 + 193.65 3. 86 – 24 4. 467.6 – 258.9
	C	Q-9 Add the following in XS-3: 1. 575 + 496 2. 89.6 + 273.7 3. 788 – 299 4. 65.44 – 39.99
Unit : II – Simplification of Logic function		
5	A	Q-1 Using laws of Boolean algebra, prove that AB + BC + A'C = AB + A'C
	A	Q-2 Show that: AB'C + B + BD' + ABD' + A'C = B + C
	B	Q-3 Show that (A+C) (A+D) (B+C) (B+D) = AB + CD
	B	Q-4 Simplify using Boolean algebra laws: F = (ABC)' + (AB)'C + A'BC' + A(BC)' + AB'C
	C	Q-5 Show that: AB + AB'C + BC' = AC + BC'
	C	Q-6 Simplify the function f((A,B,C) = (A+B) (A+C') + A'B' + A'C'
	A	Q-7 Reduce the expression using K-Map: F = $\sum_m(0,2,3,4,5,6)$
	A	Q-8 Reduce to simplest form using K-Map: F(A,B,C,D) = $\sum_m$ (0,1,2,5,8,9,10)

	A	Q-9 Reduce the Expression: F = $\prod_M$ (2,8,9,10,11,12,14)
	B	Q-10 Reduce the Expression: F = $\prod_M$ (0,1,3,4,5,6,7,13,15)
6	B	Q-1 Reduce using K-Map: f = ∑m(0, 2, 4, 6, 7, 8, 10, 12, 13, 15)
	C	Q-2 Obtain the simplified expression using K-Map: F = ABD + A'C'D' + A'B + A'CD' + AB'D
	A	Q-3 Minimize following Boolean function using K-Map: F = $\sum_m$(1,2,4,6,7,11,15)+d(0,3)
	B	Q-4 Simplify following Boolean function using K-Map: F(W,X,Y,Z) = $\sum_m$(1,3,5,8,9,11,15)+d(2,13)
	B	Q-5 Reduce the expression in SOP and POS form using K-Map: F(A,B,C,D) = $\sum_m$(1,5,6,12,13,14)+d(2,4)
	C	Q-6 Reduce using K-Map: f = ∑m(6, 7, 8, 9) + d(10, 11, 12, 13, 14, 15)
	C	Q-7 Reduce using K-Map: f = ∑m(0, 1, 4, 5, 6, 7, 9, 11, 15) + d(10, 14)
7	A	Perform hands on practical of Logic gates in Digital IC Logic Trainer Kit.
8	A	Q-1 Using D as MEV, reduce Y =A'B'C'D' + A'B'CD' + AB'C'D' + AB'C'D + AB'CD + AB'CD'
	A	Q-2 Simplify the following Boolean function using VEM. F = AB'CD + A'BC'D + AB'CD' + A'B'C'D
	B	Q-3 Simplify following Boolean function using VEM. F = A'B'C'D + A'BC'D' + A'BC'D + AB'C'D' + AB'CD' + AB'CD + ABCD'
	B	Q-4 Using E as the MEV, reduce F = A'B'C'D'E + A'B'C'DE + A'BCD'E' + A'BCD'E + AB'C'D'E' + AB'C'D'E + AB'C'D + A'BCDE'
	C	Q-5 Using C & D as MEVs, reduce Y = A'B'C'D' + A'B'C'D + A'B'CD' + A'BCD + ABCD + AB'CD
	C	Q-6 Simplify following Boolean function using VEM. F (A,B,C,D) = $\sum_m$(1,2,3,5,6,7,8,9,12,13,15)
	C	Q-7 Simplify following Boolean function using VEM. F (A,B,C,D) = $\sum_m$(0,1,3,7,8,9,11,15)

9	A	Q-1 Simplify the following Boolean function by means of Tabulation method: F (A,B,C,D) = $\sum_m$(1,2,3,5,6,7,8,9,12,13,15)
	B	Q-2 Simplify the following Boolean function by means of Tabulation method: F (A,B,C,D) = $\sum_m$(0,1,3,7,8,9,11,15)
	C	Q-3 Simplify the following Boolean function by means of Tabulation method: F = A'B'C'D + A'BC'D' + A'BC'D + AB'C'D' + AB'CD' + AB'CD + ABCD'
Unit : III – Combinational Digital Circuits		
10	A	Q-1 Minimize the logic function X = A (B'+C') (A+D). Also realize the reduced function using NOR gates only.
	B	Q-2 Simplify using Boolean laws and draw the logic diagram for the given expression. F = (ABC)' + (AB)'C + A'BC' + A(BC)' + AB'C
	A	Q-3 Reduce the expression F = $\sum_m$ (0,2,3,4,5,6) using K-map and implement using NAND gates only.
	A	Q-4 Implement following Boolean function using 8 : 1 multiplexer. Y (A,B,C,D) = $\sum_m$ (15,7,4,6,8,9,12,14)
	B	Q-5 Implement following Boolean function using 8 : 1 multiplexer. F (A,B,C,D) = $\sum_m$ (2,3,5,7,8,9,12,13,14,15)
	A	Q-6 Implement following Boolean function using 4 : 1 multiplexer. F (A,B,C) = $\sum_m$ (1,3,5,6)
	B	Q-7 Implement following Boolean function using 4 : 1 multiplexer. F (A,B,C) = $\sum_m$ (1,2,4,7)
	C	Q-8 Design a 4-Bit Binary to BCD Code Converter.
Unit : IV – Sequential Digital Circuits		
11	A	Q-1 Design 3-bit ripple up-counter using negative edge JK Flip-flops.
	B	Q-2 Design 4-bit ripple up-counter using negative edge JK Flip-flops.
12	C	Q-1 Design Modulo-8 counter using T Flip-flops.
	A	Q-2 Design Mod-10 (Decade) Counter using T Flip-flops.
	B	Q-3 Design Mod-12 using JK Flip-flops.

13	A	Q-1 Design a counter to generate the repetitive sequence 0, 3, 5, 7, 4 using D Flip-flop.
	B	Q-2 Design a counter to generate the repetitive sequence 0, 1, 2, 4, 3, 6 using T Flip-flop.
	C	Q-3 Design a JK counter that goes through states 3,4,6,7 and 3.
14	A	Q-4 Design 3-bit synchronous up counter using T Flip-flop.
	B	Q-5 Design a synchronous BCD counter with JK Flip-flop.
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