

Important Question's

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BLOCK 1

Ques.1 Truth Value :

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- $p \rightarrow q \wedge \sim r \leftrightarrow r \oplus q$
- $3+5=2$

Ques. 2 Equivalence:

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- $\sim \forall P(x) \equiv \exists x \sim P(x)$

Ques. 3 Verify that $p \wedge q \wedge \sim p$ is contradiction and $p \rightarrow q \leftrightarrow \sim p \vee q$ is a tautology

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- $p \rightarrow (q \rightarrow p)$

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Ques. 4 Prove that if $x^2 - 4 = 0$, then x not equal to by contradiction

Ques. 5 Show that under root 2 is irrational

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Ques. 6 Mathematical Induction.

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- $1 + 1/4 + 1/9 + \dots + 1/n^2 \leq 2 - 1/n$
- $5 + 10 + 15 + \dots + 5n = 5n(n+1)/2$

Ques. 7 If p and q are two propositions, then show that $\sim(p \vee q) \equiv \sim p \wedge \sim q$

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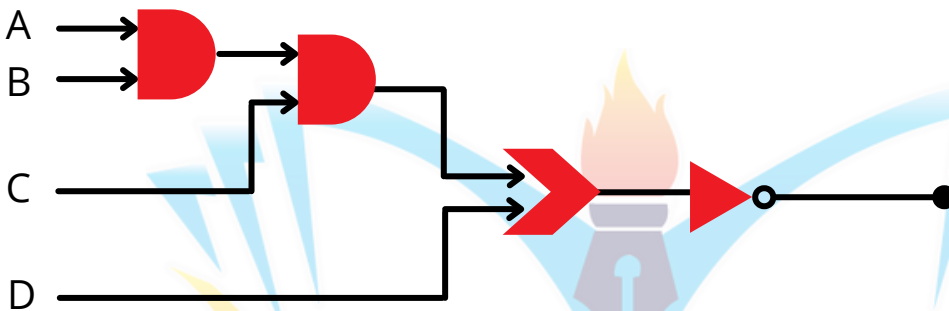
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BLOCK 1

Ques. 8 Circuit

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Ques. 9 Logic circuit

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- $xy + x'y + x'y'$

Ques. 10 Simpler Form

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- $F(a, b, c) = (a' \wedge b' \wedge c') \vee (a' \wedge b' \wedge c) \vee (a \wedge b \wedge c')$
- $X(x_1, x_2, x_3) = (x_1 \wedge x_2 \wedge x_3) \vee (x_1 \wedge x_2) \vee (x_2 \wedge x_3)$

Ques. 11 Boolean expression

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- What is dual of a Boolean expression. Explain the principle of duality with the example
- $(x + y' + z')(xy + x'z)$

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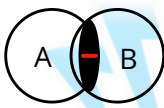


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BLOCK 2

Ques.1 Venn Diagram :

- $A \cap B \cap C$
- $A \cap B - C$



- Find the dual of $A \cup (B \cup C)$

Ques. 2 Given $S = \{1, 2, \dots, 10\}$ and a Relation R on S where

- $R = \{(x, y) \mid x + y = 10\}$

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Ques. 3 Given $A = \{1, 2, 3, 4\}$ and Relation R as $\{(1, 1), (1, 2), (1, 3), (1, 4), \dots\}$

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Ques. 4 Where r has the following properties or not ?

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- Reflexive , Transitive and Symmetric
- If $f: R \rightarrow R$ is a function such that $f(x) = 3x + 2$, prove that f is one - one ratio

Ques. 5 Find the f inverse of the function

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- $f; f(x) = x^3 - 3$
- f i. e. , f^{-1}

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BLOCK 2

Ques. 6 Let f be a permutation function defined as follows :

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- $f(1) = 2, f(2) = 4, f(3) = 1, f(4) = 3$

Ques. 7 Distinguishable words can framed in letters

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- MISSISSPPI
- PERMUTATION

Ques. 8 Explain Pascal's Triangle

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Ques. 9 Probability

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- Two dice, one red and one white, are rolled

Ques. 10 State Pigeonhole principle

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Ques. 11 What is the probability that a number between 1 and 200 is divisible by neither 2, 3, 5 nor 7

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