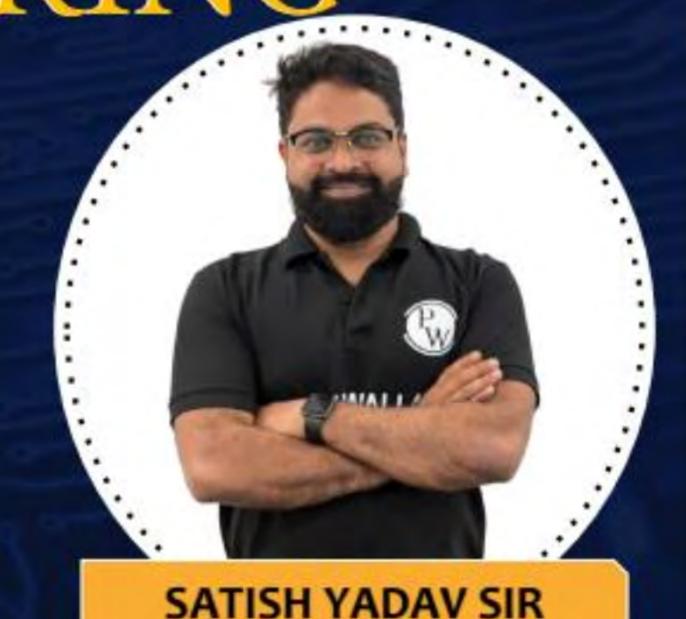
CS & IT





Discrete Mathematics Mathematical logic

DPP 01 Discussion Notes





TOPICS TO BE COVERED

01 Question

02 Discussion

Which of the following is tautology?



A.
$$(\sim p \Lambda (p \rightarrow q)) \rightarrow \sim q$$

B.
$$\sim (p \rightarrow q) \rightarrow \sim q$$

[(
$$\sim p \land q$$
) $\land [q \rightarrow (p \rightarrow q)]] \rightarrow \sim r$

D. None of these

The statement [P V (p \leftrightarrow Q) V Q] is equivalent to



P

B.

Q

C.

A tautology 🗸

D.

 $(P \land Q)$

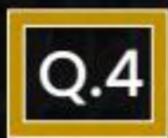
Consider the following statement



S1:
$$[(p \Rightarrow q) \land (q \Rightarrow r)] \Rightarrow (r \Rightarrow p)$$

S2: $[((p \Rightarrow q) \land (q \Rightarrow r)) \Rightarrow (p \Rightarrow r)]$
Which of the following is/are correct?

- S_1 is contingency $Q = T / (T \rightarrow T) \wedge (T \rightarrow F)$ S_2 is tautology $A = Q = T / (T \rightarrow T) \wedge (T \rightarrow F)$
- S₁ and S₂ both contingency
- S₁ and S₂ both Tautology



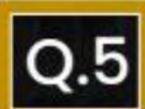
Which of the following is valid?

$$S_1: p \Rightarrow (q V r) \equiv (p \Rightarrow q) V (p \Rightarrow r)$$

$$S_2: p \Rightarrow (q \land r) \equiv (p \Rightarrow q) \land (p \Rightarrow r)$$

- A. S_1 is valid and S_2 is not valid
- B. S_1 is not valid and S_2 is valid
- Both S₁ and S₂ are valid
- D. Neither S₁ nor S₂ is valid





Which of the following is not a tautology?



$$((p \rightarrow q) \rightarrow r) \rightarrow (p \rightarrow (q \rightarrow r))$$

$$((p \rightarrow (r \vee q)) \rightarrow ((p \rightarrow r) \vee (p \rightarrow q))$$

$$(p \rightarrow (r \land q)) \rightarrow ((p \rightarrow r) \lor (p \rightarrow q))$$

$$(p \to (q \to r)) \to ((p \to q) \to r)$$



