

# GATE ASSIGNMENT

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1. Let  $p$  and  $q$  be two propositions. Consider the following two formulae in propositional logic.

$$S_1 : (\neg p \vee (p \wedge q)) \rightarrow q \quad (1)$$

$$S_2 : q \rightarrow (\neg p \vee (p \wedge q)) \quad (2)$$

Which one of the following choices is correct?

- (a) Both  $S_1$  and  $S_2$  are tautologies.
- (b)  $S_1$  is a tautology but  $S_2$  is not a tautology.
- (c)  $S_1$  is not a tautology but  $S_2$  is a tautology.
- (d) Neither  $S_1$  nor  $S_2$  is a tautology.