

GATE:EC-49-2022

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I. QUESTION

Consider a boolean gate(D) where output Y is related to the inputs A and B as, $Y = A + \overline{B}$, where $+$ denotes logical OR operation. The Boolean inputs '0' and '1' are also available separately. Using instances of only D gates and inputs '0' and '1' (Select the correct options)

- (A) NAND logic can be implemented
- (B) OR logic cannot be implemented
- (C) NOR logic can be implemented
- (D) AND logic cannot be implemented

II. SOLUTION

If a NAND gate or NOR gate is implemented from the D-Gate, it will be a universal gate.
For NOT gate:

$$\overline{A} = Dgate(0, A) \quad (1)$$

For NAND gate:

$$\overline{A.B} = Dgate(Dgate(0, A), B) \quad (2)$$

Therefore D-gate is a universal gate and all logic gates specified in the options can be implemented making (A),(C) to be the right options.

Code for implementation through C onto Vaman-ARM. write link hereseparately