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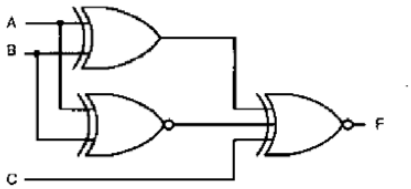
Batch: COMETFWC018
Date: 4 July 2025

GATE QUESTION
EC 2010 Q12

Question

Q.12 For the output F to be 1 in the logic circuit shown, the input combination should be:



Options:

(A) $A = 1, B = 1, C = 0$

(B) $A = 1, B = 0, C = 0$

(C) $A = 0, B = 1, C = 0$

(D) $A = 0, B = 0, C = 1$

Correct Answer: $\boxed{\text{(A) } A = 1, B = 1, C = 0}$

Explanation

From the circuit:

- The first gate is an **OR gate** with inputs A and B. - The second gate is an **AND gate** with inputs B and C. - The output of both gates is fed to another **OR gate** to get output F.

Let us compute step-by-step for option (A): $A = 1, B = 1, C = 0$

- OR gate: $A + B = 1 + 1 = 1$
- AND gate: $B \cdot C = 1 \cdot 0 = 0$
- Final OR gate: $1 + 0 = 1 \Rightarrow F = 1$

Only option (A) gives output $F = 1$.

Hence, the correct answer is: $\boxed{\text{(A)}}$