Gate 2022 EE 25

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Problem Statement

For the circuit shown below with ideal diodes, the output will be :
(*A*) $V_{\text{out}} = V_{\text{in}}$ for $V_{\text{in}} > 0$
(*B*) $V_{\text{out}} = V_{\text{in}}$ for $V_{\text{in}} < 0$
(*C*) $V_{\text{out}} = -V_{\text{in}}$ for $V_{\text{in}} > 0$
(*D*) $V_{\text{out}} = -V_{\text{in}}$ for $V_{\text{in}} < 0$

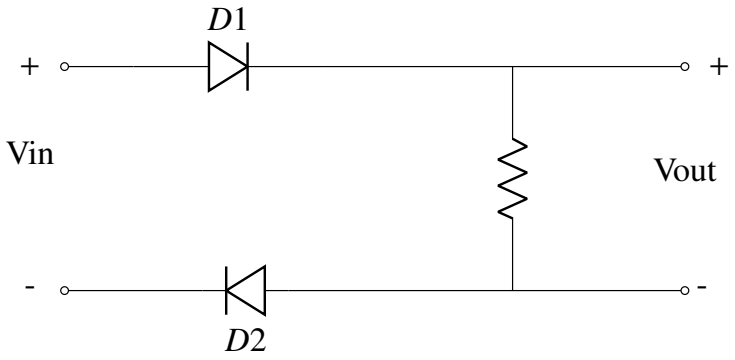

Fig. 1. Gate EE 25 fig-1

Solution

(A)

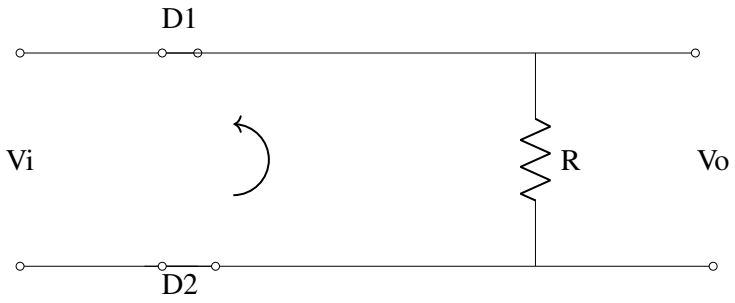

Fig. 2. Gate EE fig-2

Postive Half Cycle- D_1 and D_2 will be ON

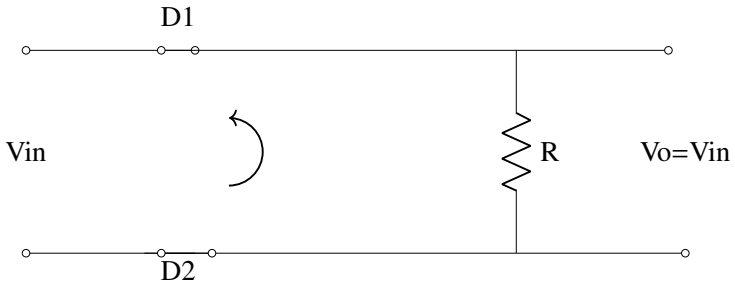

Fig. 3. Gate EE fig-3

Postive Half Cycle- D_1 and D_2 will be OFF

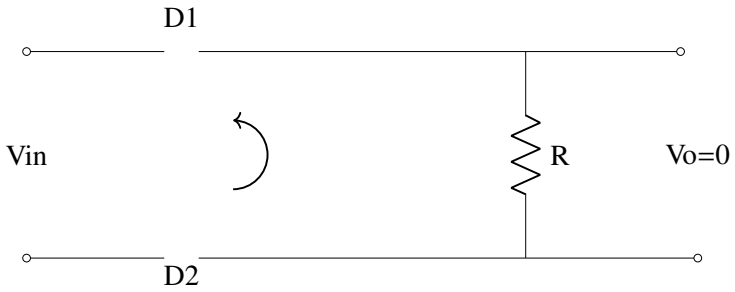

Fig. 4. Gate EE fig-4

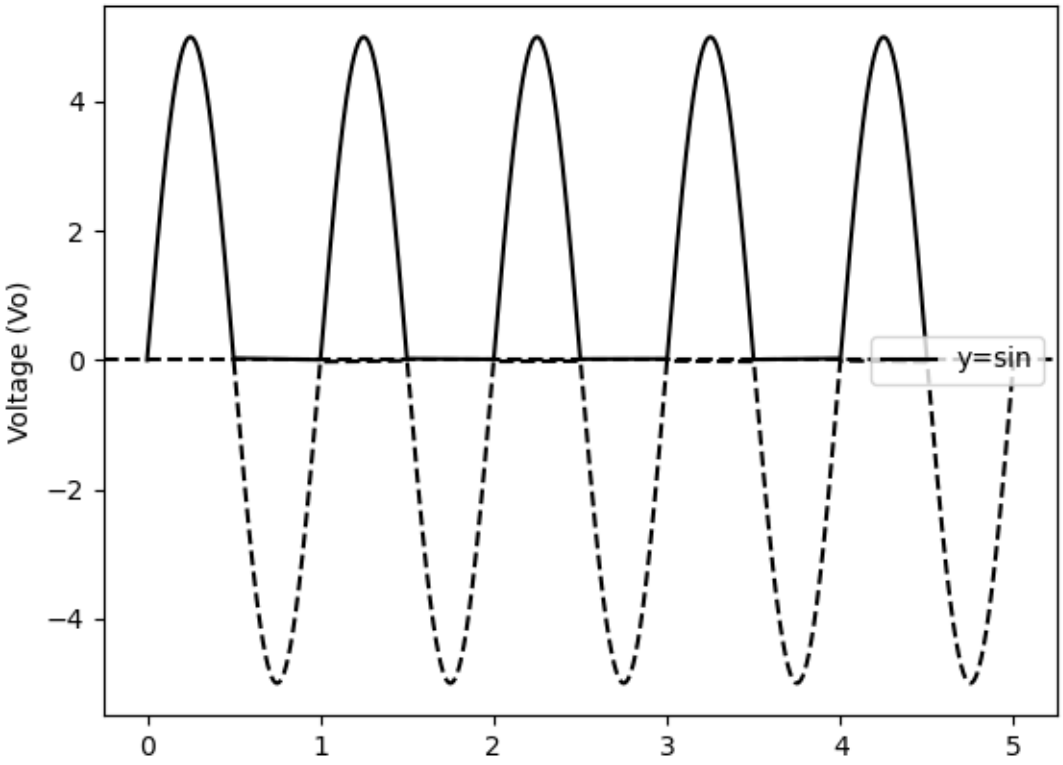

Fig. 5. Output Waveform

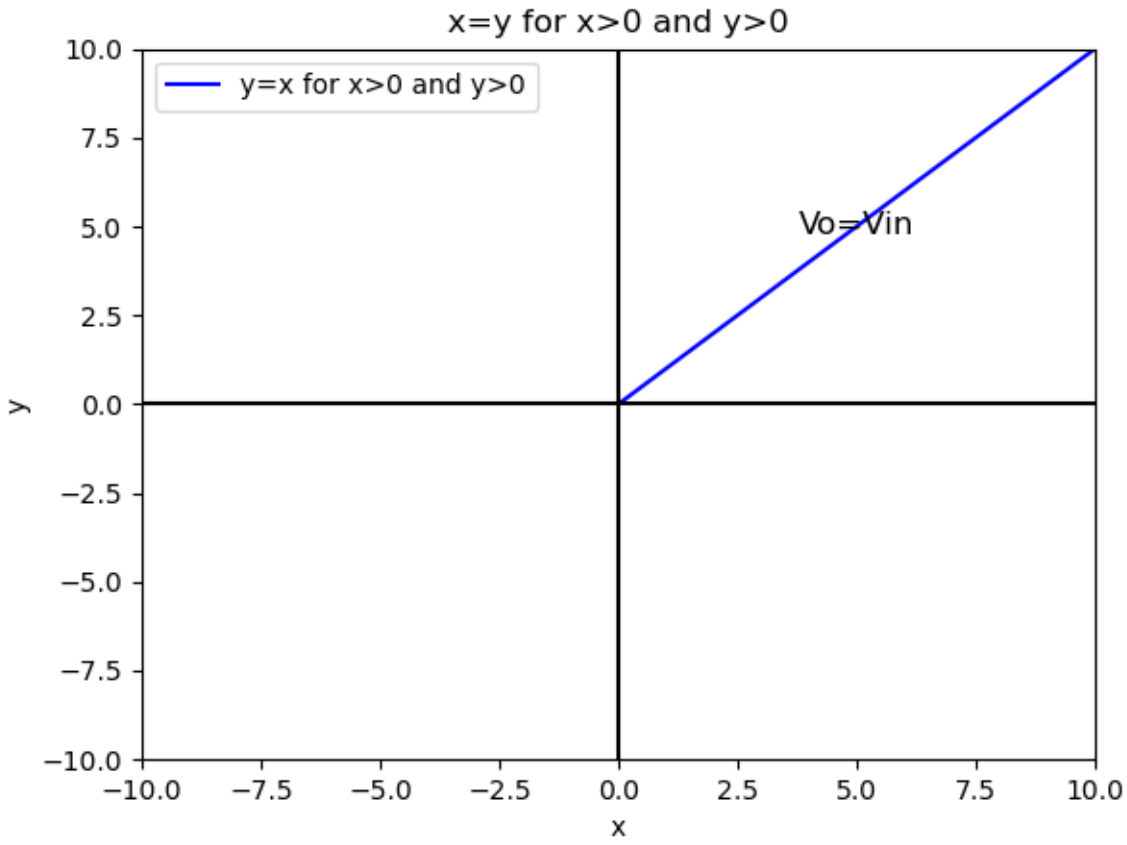

Fig. 6. Output Waveform