SOLUTION

Habib University

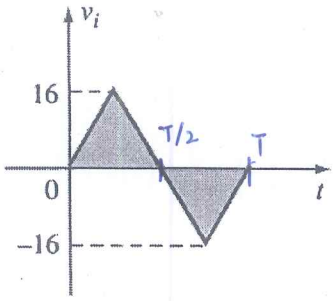
Electrical Engineering Department

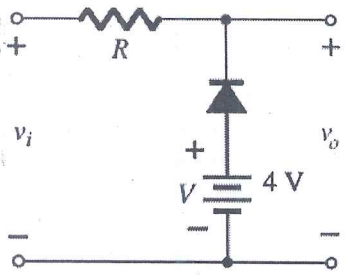
Dhanani School of Science & Engineering

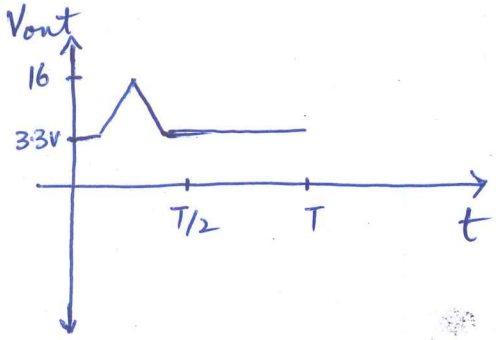
Course	EE – 211 – Basic Electronics
Semester	Fall 2022
Section	Section 1
Exam	Quiz – 2a
Instructor	Dr. Ahmad Usman
Total Marks	10

Question – 1 (CLO 2, Points: 5+5)

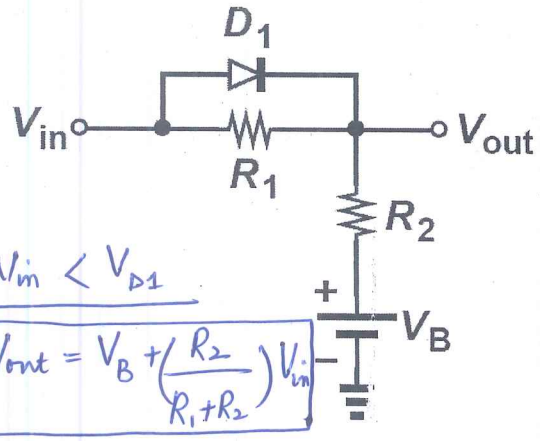
a) Determine V_O for the following circuit shown below. Draw the waveform for the circuit. Clearly label your waveform. Assume $V_{D,ON} = 0.7V$.





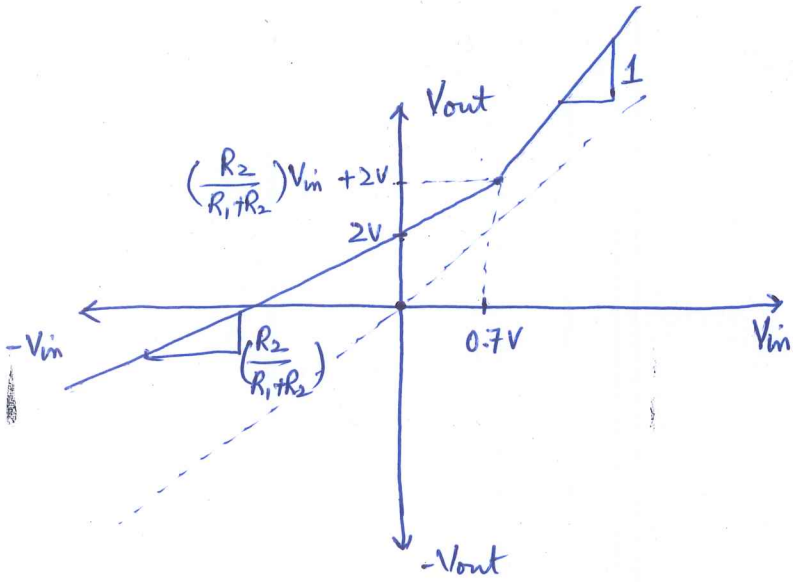


b) Draw the input-output characteristics of the circuit shown in the figure below. Use the constant-voltage model for the diode i.e., $V_{D,ON} = 0.7V$ and assume $V_B = 2V$.



① $V_{in} < V_{D1}$

$$V_{out} = V_B + \left(\frac{R_2}{R_1+R_2}\right) V_{in}$$



② $V_{in} > V_{D1}$

$$V_{out} = V_{in} + V_B$$

SOLUTION

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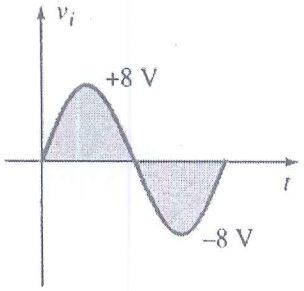
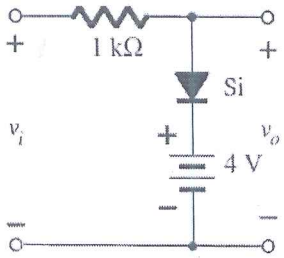
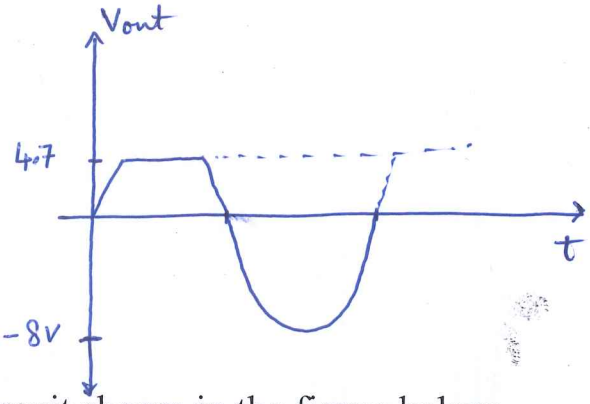
Course	EE – 211 – Basic Electronics
Semester	Fall 2022
Section	Section 1
Exam	Quiz – 2b
Instructor	Dr. Ahmad Usman
Total Marks	10

Question – 1 (CLO 2, Points: 5+5)

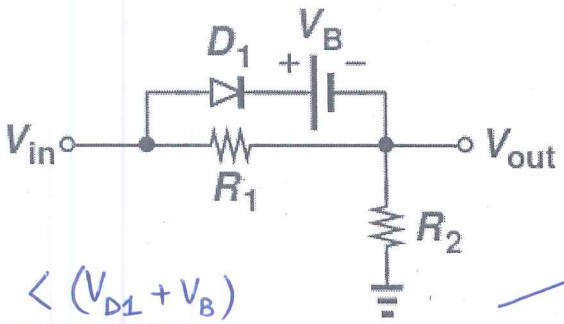
a) Determine V_O for the following circuit shown below. Draw the waveform for the circuit. Clearly label your waveform. Assume $V_{D,ON} = 0.7V$.

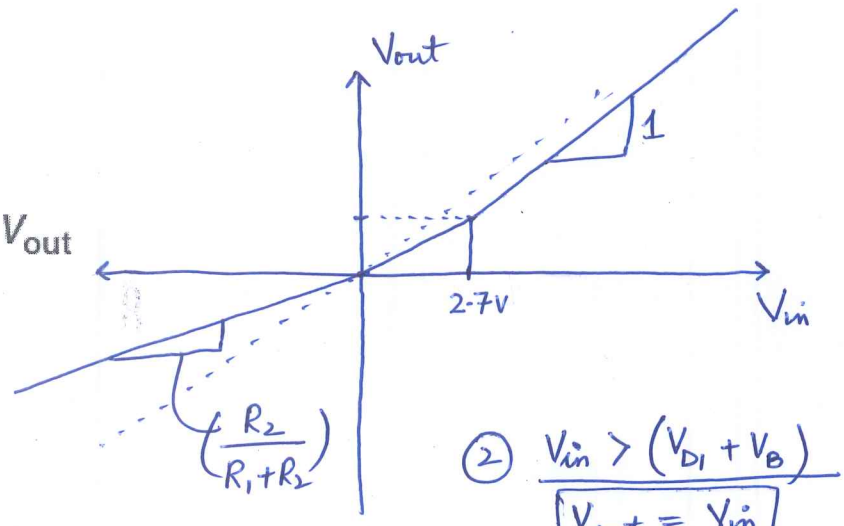






b) Draw the input-output characteristics of the circuit shown in the figure below. Use the constant-voltage model for the diode i.e., $V_{D,ON} = 0.7V$ and assume $V_B = 2V$.





① $V_{in} < (V_{D1} + V_B)$

$$V_{out} = \left(\frac{R_2}{R_1+R_2}\right) V_{in}$$

$$\frac{V_{out}}{V_{in}} = \left(\frac{R_2}{R_1+R_2}\right) < 1$$

② $V_{in} > (V_{D1} + V_B)$

$$V_{out} = V_{in}$$

$$\frac{V_{out}}{V_{in}} = 1$$