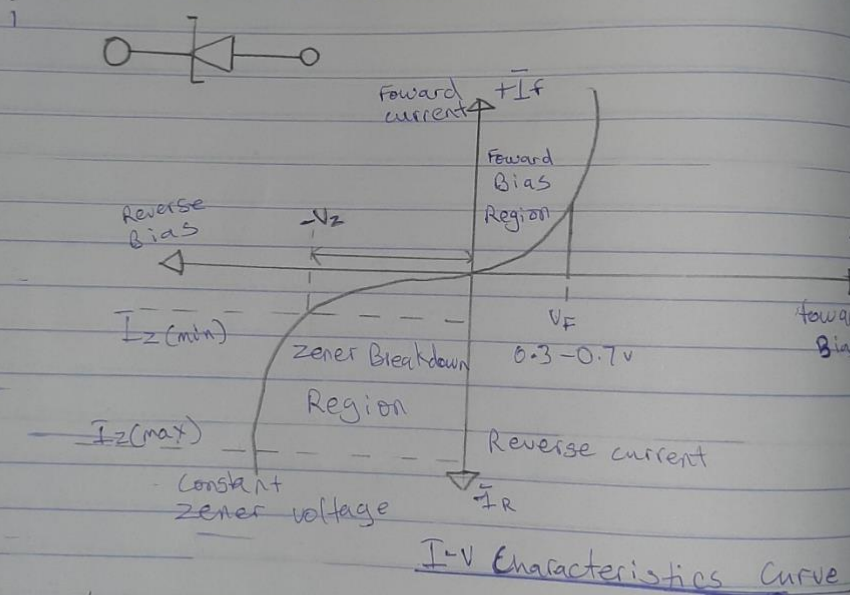


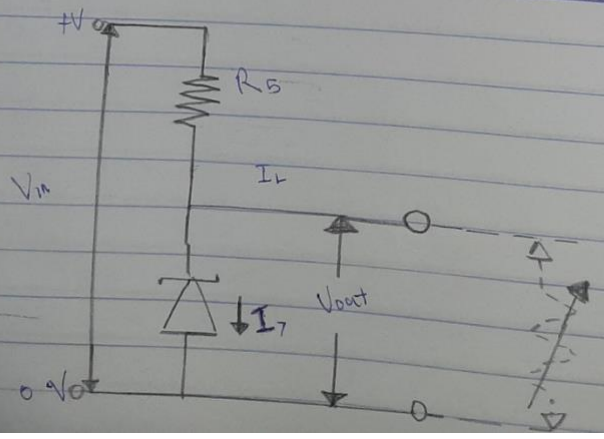
Baror Oghenetega @wirame  
 18M#501/107  
 Computer Engineering  
 Basic Elect. Eng 222

(1) (2)

① A zener diode is a diode similar to the standard PN junction diode - but they are specially designed to have a low and specified Reverse Breakdown voltage



I-V Characteristics Curve



Q2

$$P_z = 5W$$

$$I_z = 500mA$$

$$20V_{max}$$

To convert  $V_{max}$  to  $V_{dc}$

$$V_{dc} = \frac{2V_{max}}{\pi}$$

$$V_s = \frac{2 \times 20}{\pi} = 12.73V_{dc}$$

Recall that  $P = IV$

$$\therefore V = \frac{P_z}{I_z} = \frac{5}{500 \times 10^{-3}}$$

$$V_z = 10V$$

Recall that  $V_z + V_R = V_s$

$$V_R = V_s - V_z$$

$$= 12.73 - 10$$

$$= 2.73V$$

$$\therefore V = IR$$

$$R = \frac{V}{I} = \frac{2.73}{500 \times 10^{-3}}$$

$$R = 5.46\Omega$$

Since its connected in series, and same current flows through

$$I_s = I_z + I_L$$

$$I_z = I_s - I_L$$

$$I_L = \frac{V_z}{R}$$

$$= \frac{10V}{500\Omega} = 0.02A = 20mA$$

$$I_z = 500mA - 20mA = 480mA = 0.48A$$