

NAME: BOLAJI OLUWATOSIN

DEPARTMENT: BIOMEDICAL ENGINEERING

MATRIC NUMBER: 18/SCI05/003

$$\text{Power} = 5 \text{ W}$$

$$I = 500 \text{ mA} \rightarrow \text{A}$$
$$= 0.5 \text{ A}$$

$$\text{max current} = \frac{\text{max power}}{\checkmark}$$

$$0.5 \text{ A} = \frac{5 \text{ W}}{\checkmark}$$

$$0.5 \text{ A} \cdot V = 5 \text{ W}$$

$$V = \frac{5 \text{ W}}{0.5 \text{ A}}$$

$$V = 10 \text{ V}$$

$$V_{\text{dc}} = 0.637 \text{ V max}$$

$$= 0.63 \times 20$$

$$= 12.74 \text{ Vdc}$$

Recall $V_z + V_R = V_s$

$$V_R = V_s - V_z$$
$$= 2 \times 20$$

↑

$$R_s = \frac{V_s - V_z}{I_z} = \frac{12.74 - 10}{0.5}$$

$$R = 5.48 \Omega$$

ii) I_{Z} & I_{L} Connection in Series,

$$I_s = I_z + I_L$$

$$I_z = I_s - I_L$$

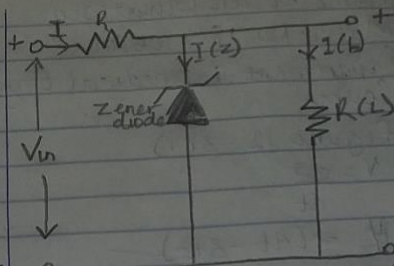
$$I_L = \frac{V_z}{R} = \frac{10 \text{ V}}{500 \Omega} = 0.02 \text{ A}$$

$$I_z = 500 \text{ mA} - 20 \text{ mA}$$

$$= 480 \text{ mA}$$

$$= 0.48 \text{ A}$$

Name: Bolaji Oludotun
 Matric Number: 1615C1051003
 Department: Biomedical Eng.
 Course: Basic Electricity



$$I = I(z) + I(L)$$

Circuit diagram

1) A Zener diode is a special type of device designed to operate in the Zener breakdown region. Zener diodes act like normal p-n junction diodes under forward biased condition.

When forward biased voltage is applied to the Zener diode it allows large amount of electric current and blocks only a small amount of electric current.

2) Power = 5W

$$I = 500\text{mA} = 0.5\text{A}$$

max current = max Power

$$0.5\text{A} = \frac{5\text{W}}{V}$$

$$0.5\text{AV} = 5\text{W}$$

$$V = \frac{5\text{W}}{0.5\text{A}}$$

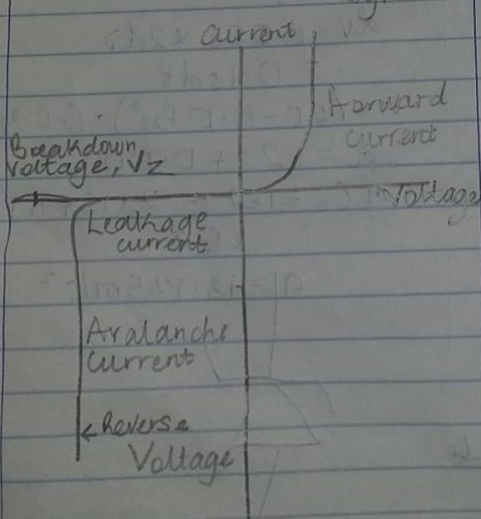
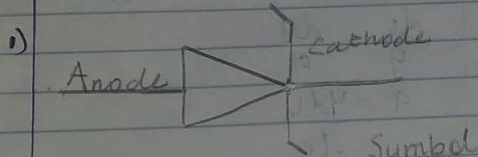
$$V = 10\text{V}$$

$$V_{dc} = 0.637 V_{max}$$

$$V_{dc} = 0.637 \times 20$$

$$= 12.74\text{Vdc}$$

minimum resistance =



I-V Characteristics Curve