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18/ENG01/004
Chemical Engineering
Basic Elect.

2 → $P_z = 5w$

$I_z = 500mA$

Then conv. V_{max} to VDC

$20V_{max}$

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

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

Recall that $P = IV$

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

Recall that $V_z + V_R = V_s$

$\therefore V_R = V_s - V_z$

$\therefore \frac{2 \times 20}{\pi} - 10 = 12.73 - 10 = 2.73V$

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

$\therefore R = 5.46$

The connection is in series so ; $I_s = I_z + I_L$

$I_z = I_s - I_L$

$I_L = \frac{V_z}{R} \therefore \frac{10V}{500\Omega} = 0.02A \therefore 20mA$

$I_z = 500mA - 20mA$

$\therefore 480mA = 0.48A.$

1 → Describe a zener diode regulator.

A zener diode is always operated in its reverse biased condition. As such a simple voltage regulator circuit can be designed using a zener diode to maintain a constant DC output voltage across the load in spite of

variations in the
is the load curre

i → Sketch the symb

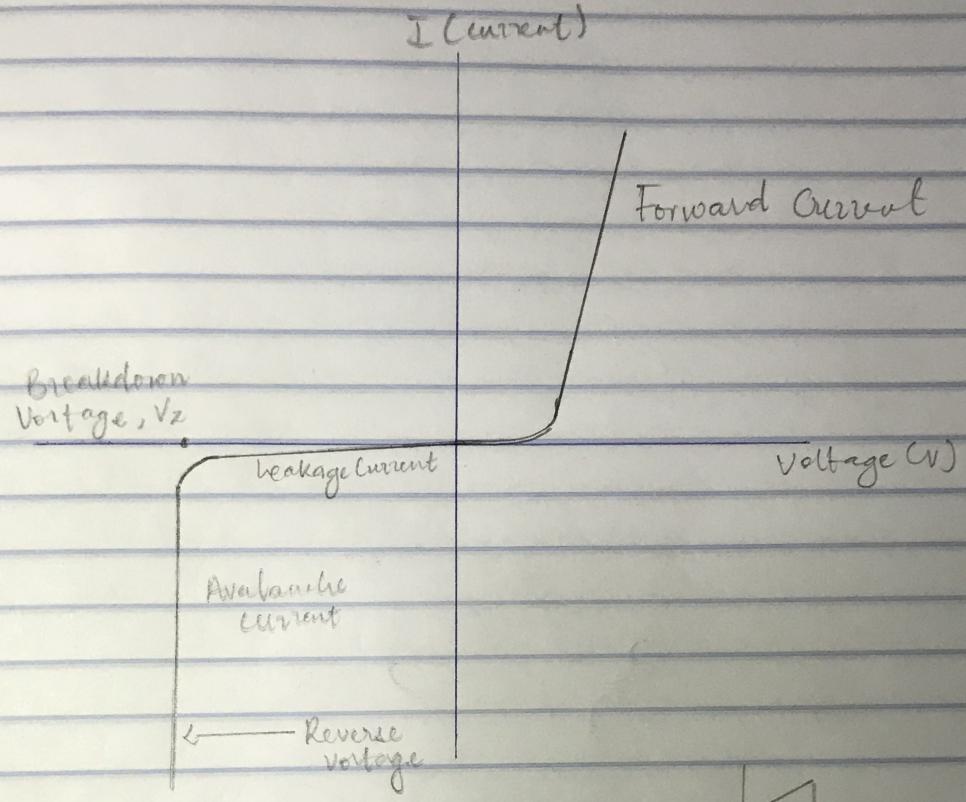
Breakdown
Voltage, V_z

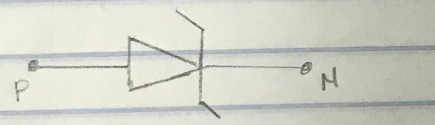
Symbo

ii → Sketch and

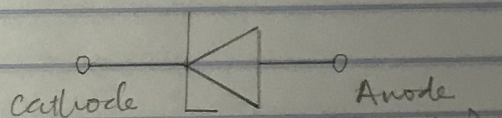
variations in the input voltage or changes in the load current.

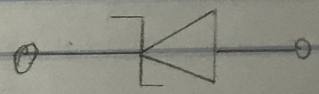
i → Sketch the symbol and I-V characteristics curve





Symbol for zener diode





ii → Sketch and label the circuit diagram