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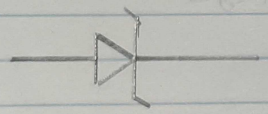
Reg No: 18/ENG06/035

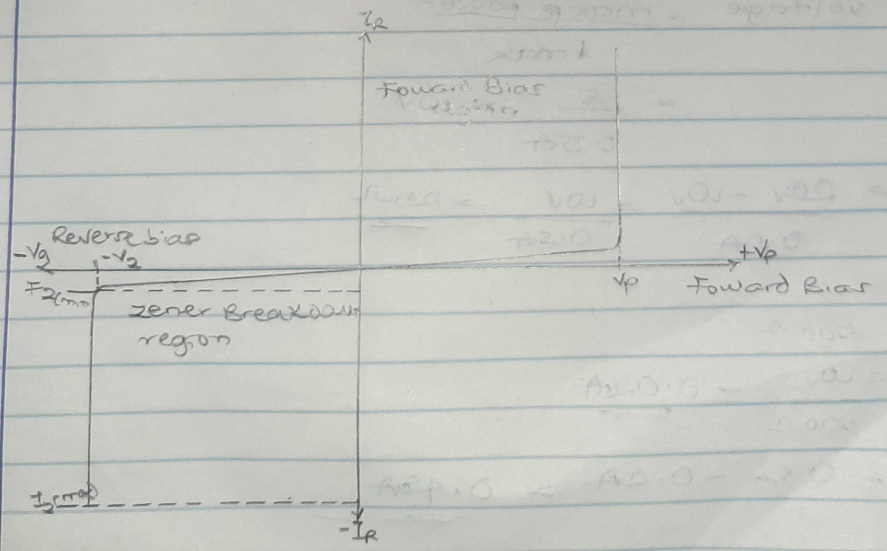
1. Describe a zener diode regulator.

* A zener diode is a general purpose diode, which behaves like a normal diode when foward biased, but when it is reverse biased above a certain voltage known as zener breakdown voltage or zener voltage, the voltage remains constant for a wide range of current.

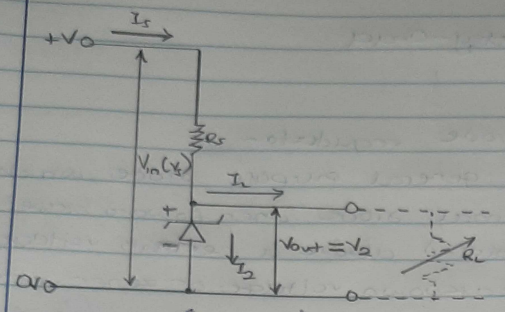
A zener diode can be used as a regulator, in this context it can be called a zener diode regulator since it keep the voltage constant for a range above the zener breakdown voltage.

ii) Symbol for the zener diode is





Zener diode I-V characteristic



Circuit diagram

Number 2.

Current = 500mA = 0.5A

Power(P) = 5watts

maximum current = $\frac{\text{max power}}{\text{voltage}}$ = Imax

Imax = 0.5A

Voltage = $\frac{\text{max power}}{\text{Imax}}$

= $\frac{5}{0.5A}$ = 20V

$R_s = \frac{20V - 10V}{0.5A} = \frac{10V}{0.5A} = 20\Omega$

ii) $R = 500\Omega$

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

iii) $I_x = 0.5A - 0.2A = 0.48A$