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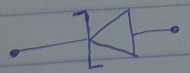
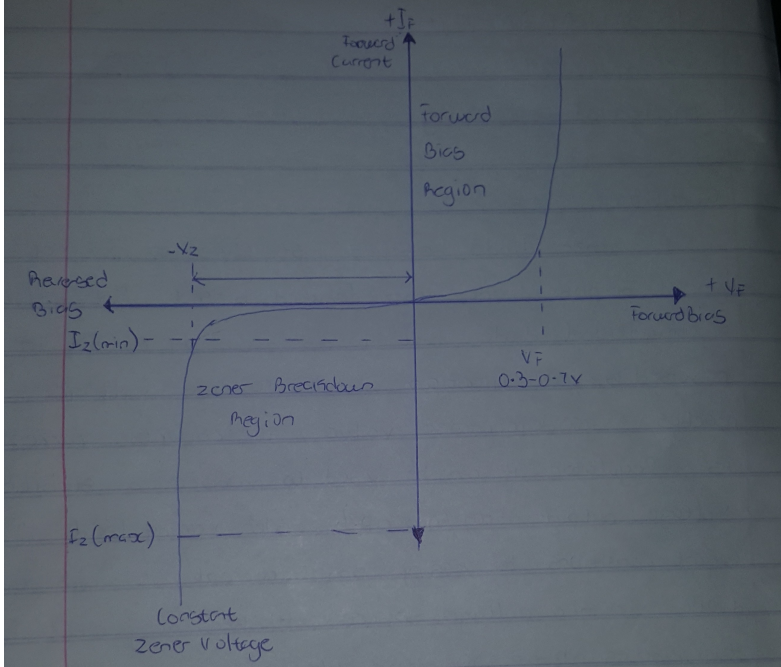
18/Eng06/029
Mechanical Engineering

Question 1

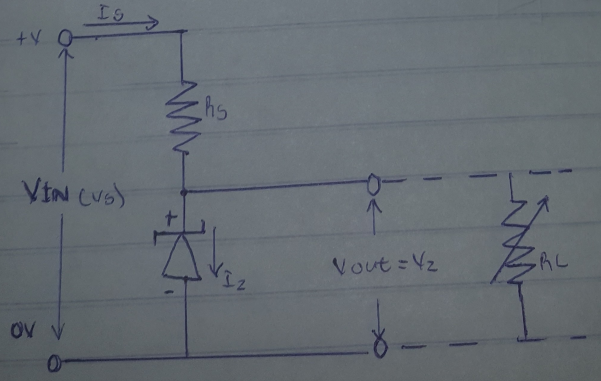
A zener diode behaves just like a normal general purpose diode when forward biased but unlike a conventional diode that blocks flow of current in the reversed biased direction, when the reverse voltage reaches a predetermined value, it conducts current. As a Regulator, it can be used to produce a stabilized voltage output with low ripple under varying load current conditions by passing small current through the diode from a voltage source. It basically stabilizes the ripples on the DC output voltage.



Symbol



I-V Characteristics



DIAGRAM

Question 2

i $P = IV$

$\therefore V = P/I_2$

$V_2 = \frac{5 \text{ watts}}{500\text{mA}} = 10V$

Minimum value

$= \frac{V_s - V_2}{I_2} = \frac{20 - 10}{500\text{mA}}$

$R_S = 20\Omega$

ii $I_L = \frac{V_2}{R_L} = \frac{10}{500\Omega} = 0.02A$

$I_L = 0.02A$