

## ⊖ Labels

+  $R_S$  - Resistor

+  $V_S$  - Voltage source

+  $V_{out}$  - stabilised output voltage

+  $R_L$  - Load Resistance

+  $I_Z$  - Load current across zener Diode

2 Max Power = 5W  $I_Z = 500\text{mA} = 0.5\text{A}$ ,  $20\text{V}_{max} = V_S$

i Maximum Current =  $\frac{\text{Max Power}}{\text{Voltage}} = \frac{5\text{W}}{V} = 0.5\text{A}$

$V_Z = 10\text{ volts}$

Minimum resistance =  $\frac{V_S - V_Z}{I_Z} = \frac{V_S - V_Z}{I_Z}$

~~$V_S = 0$~~   $V_{dc} = 0.637V_{max}$   
 $= 0.637 \times 20$   
 $= 12.74\text{ V}_{dc}$

Minimum resistance =  $\frac{12.74 - 10}{0.5} = 5.48\ \Omega$

Load current  $I_L = \frac{V_Z}{R_L} = \frac{10}{500} = 0.02\text{A}$  or  $20\text{mA}$

$I_Z = I_S - I_L$   
 $= 500 - 20 = 480\text{mA}$