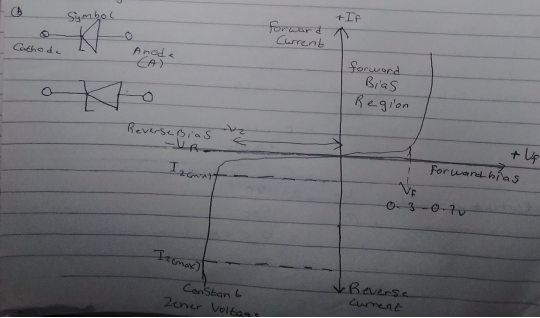


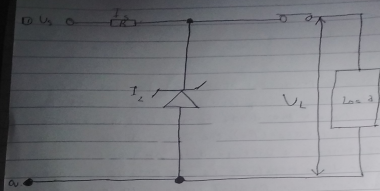
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Solution

(1) Zener diodes can be used to produce a stabilised voltage output with low ripple under varying load current conditions. By passing a small current through the diode from a voltage source, via a suitable current limiting resistor (R_s), the Zener diode will conduct sufficient current to maintain a voltage drop of $V_{z0.1}$.

The function of a Zener diode regulator is to provide a constant output voltage to a load connected in parallel with it in spite of the ripples in the supply voltage or variations in the load current. A Zener diode will continue to regulate its voltage until the diode's holding current falls below the minimum (I_{zmin}) value in the reverse breakdown region.





② Maximum power = 5W
Maximum current = 500mA

③ $V_s = 27V$

$V_D = 20V$

$I_D = 500mA$

Minimum value = $\frac{27-20}{500} = 0.014$

$= 0.014 \times 1000$
 $= 14 \Omega$

④ Current = $I_L = \frac{V_D}{R_L} = \frac{20}{500}$
 $= 0.04A$