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DEPT: CIVIL

2) Max Power = 5W

$$I_Z = 500 \text{ mA} = 0.5 \text{ A}$$

$$200 \text{ mA} = V_e$$

maximum current = max power

$$I_{Z(\text{max})} = \frac{5W}{V} = 0.5 \text{ A}$$

$$V_Z = 100 \text{ V}$$

minimum resistance = $\frac{V_s - V_Z}{I_Z}$

$$\begin{aligned} V_{de} &= 0.637V \\ &= 0.637 \times 20 \\ &= 12.74 \text{ Vde} \end{aligned}$$

$$\begin{aligned} \text{minimum resistance} &= \frac{12.74 - 10}{0.5} \\ &= 5.8 \Omega \end{aligned}$$

ii) Load current: $I_L = \frac{V_Z}{R_L} = 100 \text{ V} \cdot 0.02 \text{ A} = 20 \text{ mA}$

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