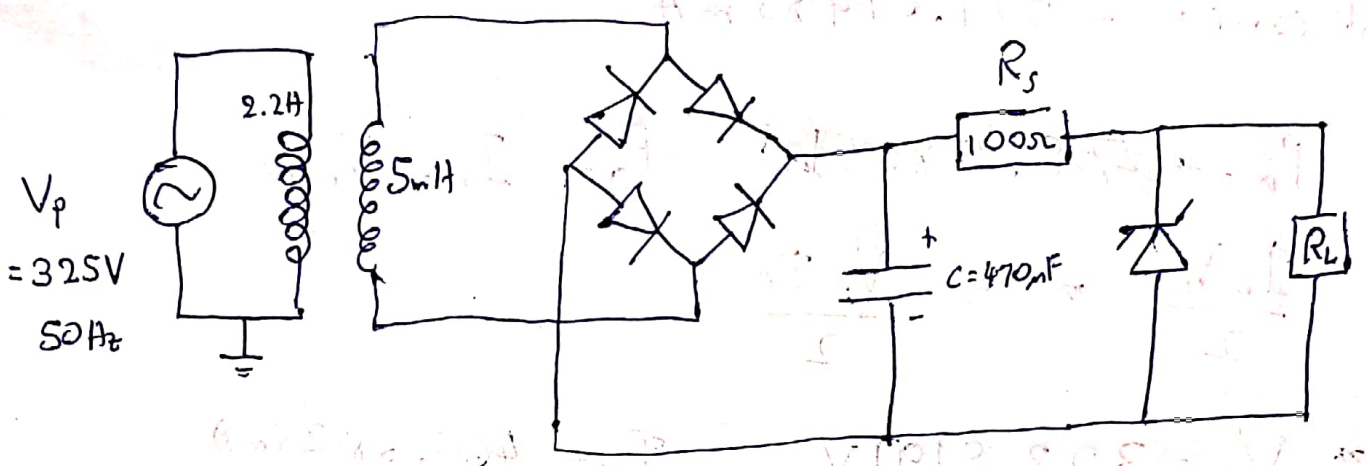
200029B

01)



$R_L = 1000 + 29 = 1029\Omega$

02) 11.94V approximately 12V

03) $V_{pp} = 322.016\ mV$ (peak to peak voltage)

$$\gamma = \frac{V_{pp}}{V_{DC}} = \frac{322.01672mV}{11.94} = 0.02696$$

04) $I_{Z\ minimum} = 4.744mA$

$I_{Z\ maximum} = 7.928mA$

max power dispated in zener diode $P_{max} = 94.394mW < 250mW$

∴ Zener diode can handle the maximum current.

05) PIV = 14.644293 V for each diode

peak current = 221.01423 mA

06) ~~$P_{ac} = 785.5824$~~ $P_{ac} = I_{r.m.s} V_{r.m.s}$

$P_{ac} = \frac{I_m V_m}{2} = \frac{V_p I_p}{2}$

$V_p = 323.5191 V$ $I_p = 466.6825 mA$

$\therefore P_{ac} = 75.49 W$

$P_L = V_L I_L = 11.94 V \times 11.605 mA = 0.13856 W$

07) $\eta = \frac{P_L}{P_{ac}} \times 100\% = \frac{0.13856}{75.49} \times 100\%$

$= 0.1836\%$

08) Increase the capacitance of smoothing capacitor then it helps to reduce V_{pp} voltase therefore it optimize the zener resulation