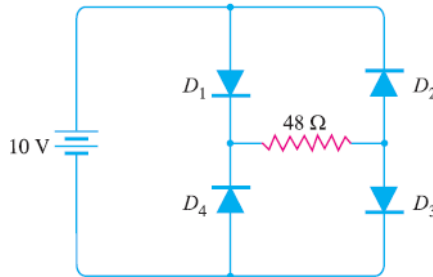


Assignment:-4

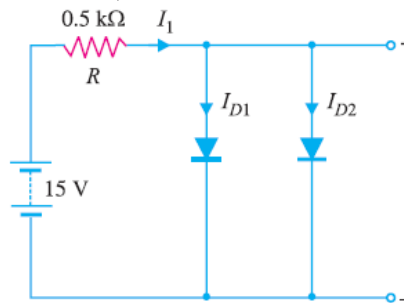
EA1210-Introduction to EE & ECE, Unit 4: Fundamental of Semiconductor

Note: - All resistances are in ohm (Ω)

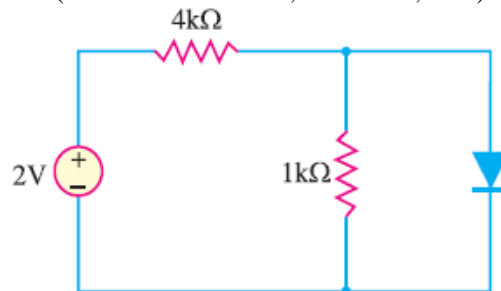
1. Calculate the current through 48Ω resistor in the circuit shown in Fig. Assume the diodes to be of silicon and forward resistance of each diode is 1Ω . (Ans: 172 mA)



2. Determine current through each diode in the circuit shown in Fig. Use simplified model. Assume diodes to be similar. (Ans: 14.3 mA)



3. Determine the state of diode for the circuit shown in Fig. and find I_D and V_D . Assume simplified model for the diode. (Ans: $I_D = -0.375 \text{ mA}$, $V_D = 0.4 \text{ V}$, OFF)



4. The applied input a.c. power to a half-wave rectifier is 100 watts. The d.c. output power obtained is 40 watts. (i) What is the rectification efficiency? (ii) What happens to remaining 60 watts? (Ans (i) 40%)
5. An a.c. supply of 230 V is applied to a half-wave rectifier circuit through a transformer of turn ratio 10 : 1. Find (i) the output d.c. voltage and (ii) the peak inverse voltage. Assume the diode to be ideal. (Ans: 10.36 V, 32.53 V)
6. A crystal diode having internal resistance $r_f = 20 \Omega$ is used for half-wave rectification. If the applied voltage $v = 50 \sin \omega t$ and load resistance $R_L = 800 \Omega$, find : (i) I_m , I_{dc} , I_{rms} (ii) a.c. power

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input and d.c. power output (iii) d.c. output voltage (iv) efficiency of rectification. (Ans 61 mA, 0.763 watt, 0.301 watt, 15.52 volts, 39.5%)

7. In the centre-tap circuit shown in Fig., the diodes are assumed to be ideal i.e. having zero internal resistance. Find : (i) d.c. output voltage(ii) peak inverse voltage (iii) rectification efficiency. (Ans: 20.7 V, 65 V, 81.2 % ,)

