



Assignment 03
Basic Electronics / Physics
BC (CS) / BS (SE)
Fall Semester 2018

Note: Supplement your answers with *examples, diagrams, and graphs* if necessary.

Q.1 Give answers to each of the following:

1. What is knee voltage?
2. How analog and digital multimeter can be used to check whether a diode is open, short, or leaky?
3. Discuss the following parameters in data sheet for 1N4001:
 - a. Reverse Breakdown Voltage
 - b. Maximum Forward Current
 - c. Forward Voltage Drop
 - d. Maximum Reverse Current
4. Discuss surface Mount diodes using examples.

Q.2 Differentiate each of the following:

1. Linear and nonlinear devices
2. Forward biased and reverse biased diode
3. Ideal, second, & third approximation of a diode
4. Power dissipation and power rating of a diode
5. Forward Resistance and reverse Resistance of a diode

Q.3 Draw and explain each of the following diagrams/circuits:

1. Schematic Symbol and Case Styles of a diode
2. IV characteristic curve of a diode
3. Forward biased and reverse biased diode
4. Load line and Q-point of a diode

Q.4 Solve each of the following:

1. A diode has a power rating of 2 W. If the diode voltage (V_D) is 1.1 V and the diode current (I_D) is 2 A, what is the power dissipation (P_D)? Will the diode be destroyed?
2. Calculate the load current (I_L), load voltage (V_L), load power (P_L), diode power (P_D), and total power (P_T) in circuits given in Figure 01, Figure 02, Figure 03, and Figure 04.
3. Draw the circuit in Figure 04 and its Thevenin's circuit using Multisim and find I_L , V_L , and V_D in both circuits. Also attach the Multisim circuit diagrams in the assignment.
4. Suppose the circuit in Figure 03 is not working. What are the possible troubles?
5. Find the bulk resistance (R_B) for the values $V_2 = 0.93$ V, $I_2 = 1$ A, $V_1 = 0.7$ V, and $I_1 = 0$.

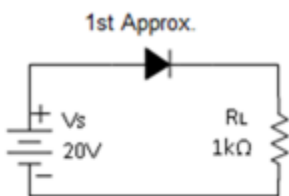


Figure 01

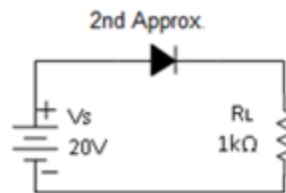


Figure 02

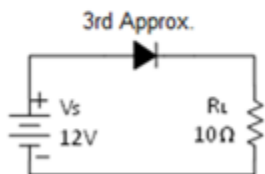


Figure 03

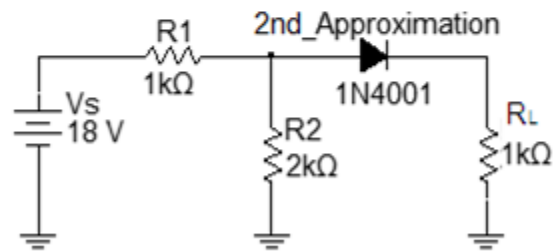


Figure 04