# 21AIE113- INTRODUCTION TO ELECTRONICS

**Group Assignment 2**

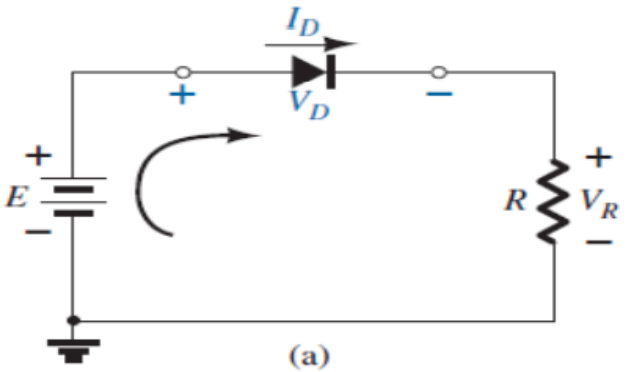
Submission Date: 17/04/2022,11.59 PM

Submission link: Assignment 2

Answer all Questions
One submission per group
Submission format – doc,pdf

1. Perform the experiment for investigating Zener diode characteristics in Falstad circuit simulator.
    a) Explain the theory behind the experiment
    b) Draw the circuit diagrams, mention the components used, and state the procedure of the experiment.
    c) Plot the V-I characteristics for both forward bias and reverse bias.
    d) Mark the breakdown voltage of zener diode, and calculate the static and dynamic resistance in the case of reverse bias (show the calculation of values graphically). Write down the inference from the VI characteristics.

2. Write a Matlab program to estimate the operating point of the following circuit. Assume resistance of 1 k ohms, and E=10 V, $I_s$=10pA and n=1. Plot the forward and load-line and mark the operating point on the forward characteristics. Write down the inference from the experiment.



(a)

3. Perform the experiment for demonstrating the application of a diode as a Half-wave rectifier in Falstad circuit simulator
    a) Explain the theory behind the experiment.
    b) Draw the circuit diagrams, Mention the components used, and state the procedure of the experiment.

c) Plot the input and output waveforms.
d) Compute/obtain the value of Vm, Vrms, Vdc, and ripple factor.
e) Redo the experiment using a capacitive filter and plot the input and output waveforms
f) Compute/obtain the value of Vm,Vrpp, V r,rms, Vdc, and ripple factor.
g) Write down the inference from the experiment.