21AIE113- INTRODUCTION TO ELECTRONICS

Group Assignment 5

Submission Date: 14/06/2022, 11.59 PM

Submission link: Assignment 5

Answer all Questions
One submission per group
Submission format – doc,pdf
Mention the contribution from each member.

1. Perform the experiment for demonstrating Common-Emitter Characteristics of an NPN transistor 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 characteristics
    d) Calculate the following parameters – dynamic input resistance – dynamic output resistance – Common-base current gain
    e) Comment on the values obtained in (d)
2. Design a BJT CE amplifier (in voltage-divider biasing configuration with an emitter Feedback resistor). Fix V_{CC}=20V, and operating point as I_{CQ}=10mA, V_{CEQ}=8 V, and beta as 100 (Assume any values, if not given it). Plot the input and output waveforms. Calculate the input impedance, output impedance, voltage gain and current gain with respect to source. Comment on the values obtained.
3. Design a BJT CE amplifier (in fixed-biasing configuration). Fix V_{CC}=20V, and operating point as I_{CQ}=10mA, V_{CEQ}=8 V, and beta as 100 (Assume any values, if not given it). Plot the input and output waveforms. Calculate the input impedance, output impedance, voltage gain and current gain with respect to source. Comment on the values obtained.
4. Design a unity gain amplifier (CC amplifier/ Emitter follower) using BJT (in voltage-divider biasing configuration with an emitter Feedback resistor). Fix V_{CC}=12V, and operating point as I_{CQ}=2mA, V_{CEQ}=6 V, and beta as 100 (Assume any values, if not given). Plot the input and output waveform. Calculate the input impedance, output impedance, voltage gain and current gain with respect to source. Comment on the values obtained.