Experiment #3 – Transistor Biasing

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# EEE3307 Electronics I

Section 0014

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# **Project Description**

The objective of this experiment was to construct and analyze circuits based on transistors. The primary aim was to familiarize students with transistor biasing, bias stability, and Q-point.

# **2.0 About Laboratory Day and Equipment List**

# The laboratory session took place on the Monday section between 6:00pm and 8:50pm on September 25, 2023. My lab partners were Nicolas and Brandon. The equipment for the is experiment is listed below,

1. Breadboard
2. Tektronix MSO 4034 Oscilloscope
3. Tektronix AFG3022 Function Generator
4. Resistors
5. 2N2222 NPN BJT Transistor

# **3.0 Computer Simulation (SPICE)**

# Pre-Laboratory Questions

A) Consider the circuit in Fig. 1.b with RC = 1.8 kΩ, RB = 5.6 kΩ, and RE = 0 Ω.

A diagram of a circuit

Description automatically generated

Fig. b

B) Calculate VBB so that IC = 2 mA. Assume β = 220 and VBE = 0.7 V. Find the Q-point.

C) If β changes to 150, what is the new IC from your circuit simulation? (Consult with your lab

instructor how to change the current gain β in the 2N222 model parameter in MultiSim.)

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D) Repeat (B) above if RE is changed to 1.8 kΩ.

E) Consider the circuit in Fig. 3 with RC = RE = 1.8 kΩ. Calculate the values for R1, R2 so that

ICQ = 2 mA. Use a sinusoidal input (small-signal peak to peak voltage of 20 mV) and current

gain of 150 in your circuit simulation. Plot vi

, vC, vE, and vCE versus time.

# **4.0 Experiment Procedure**

# Full Wave Rectifier Circuit

# **5.0 Observations and Simulation Comparison**

# **6.0 Learned Objectives**

# **7.0 Conclusion**

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