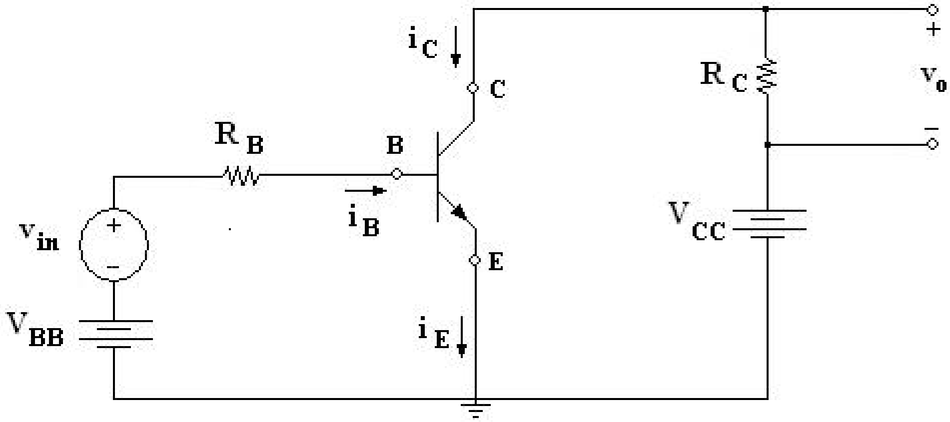
JEE2330 – Spring 2025
Lab #6 Problem

A grounded emitter circuit using the 2N222A BJT is shown (where $V_{BB} = V_{CC} = 10$ V and $R_C = 1.0$ kΩ). Perform a graphical analysis to determine the operating point of the transistor, related DC and hybrid π parameters, small signal equivalent circuit, and small signal voltage gain. Follow the steps given below.



1. Draw the load line on the 2N2222A transistor characteristics shown on the reverse side and select a midrange operating point voltage ($V_{CEQ} = V_{CC}/2$) that will allow essentially equal positive and negative voltage swings. Identify the corresponding operating point (Q point) currents.

V_{CEQ} = __________
I_{CQ} = __________
I_{BQ} = __________

2. Calculate the base resistance R_B required to obtain the operating base current I_B.

R_B = __________

3. Find the grounded emitter DC current gain ($\beta_{DC} = I_C/I_B$) at the Q point.

β_{DC} = __________

4. Find the small signal hybrid π parameters assuming the operating temperature is 27°C.

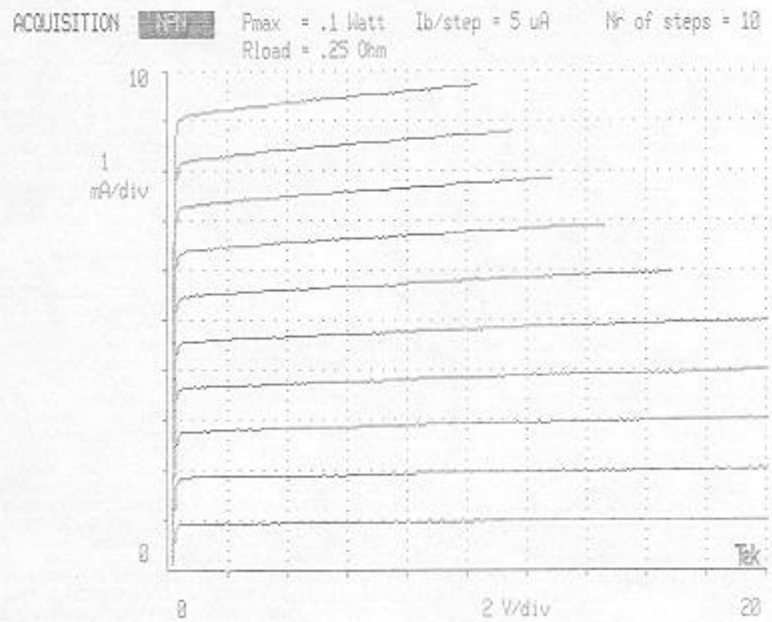
β_{AC} = _________
r_{oc} = _________
r_π = _________

5. Draw the small signal equivalent circuit for the amplifier in the space below.

6. Find the associated small signal voltage gain ($A_V = v_o/v_{in}$) for the circuit.

A_V = _________

TEKTRONIX 571 Curve Tracer



Screen copy (since power up) #2