

Q1) For a npn transistor, the emitter current (I_E) is given to be 3 mA and $\beta = 50$.

Calculate the following quantities:

Collector current (I_C)

Base current (I_B)

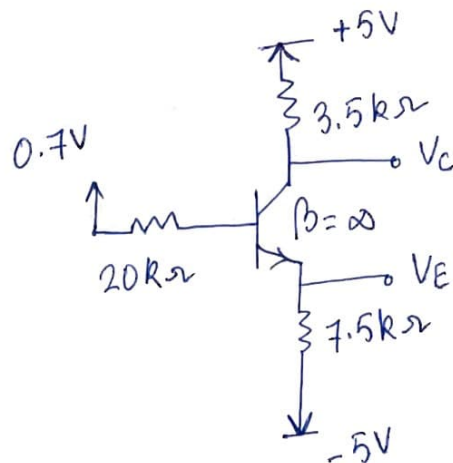
Q2) For a pnp transistor, the emitter current (I_E) is given to be 1 mA and $\beta = 10$.

Calculate the following quantities:

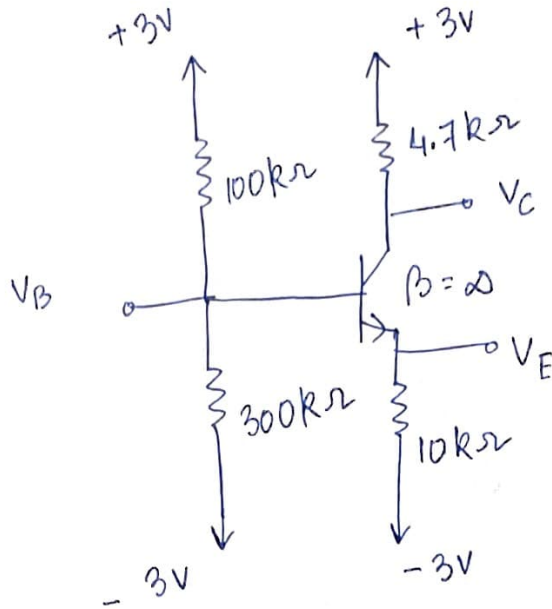
Base current (I_B)

Current gain (α)

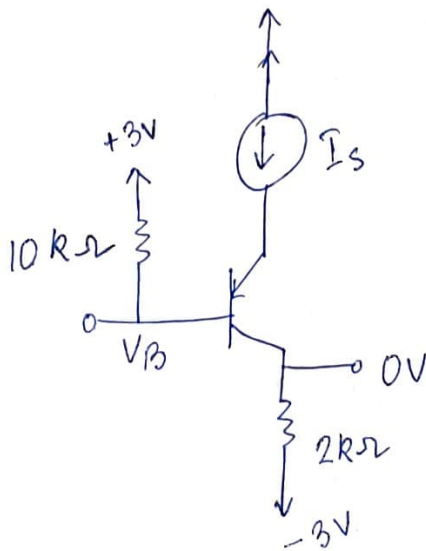
Q3) For the given circuit, assume $V_{BE} = 0.7V$, and calculate the emitter and collector voltages.



Q4) For the given circuit, assume $V_{BE} = 0.7V$ and calculate the emitter, base and collector voltages.

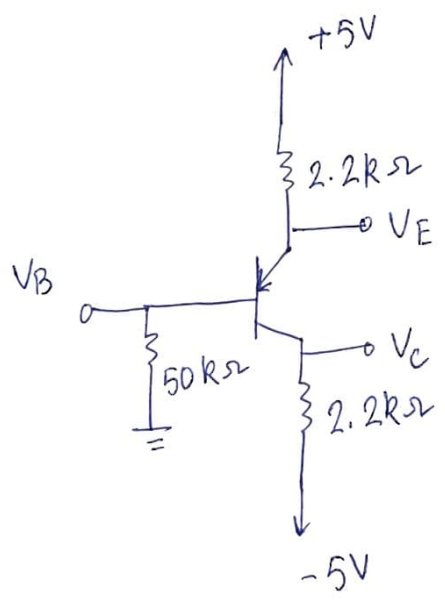


Q5) For the given circuit, assume $|V_{BE}| = 0.7V$, $\beta = \infty$ and calculate the emitter, base and collector currents. Also calculate the base voltage V_B .

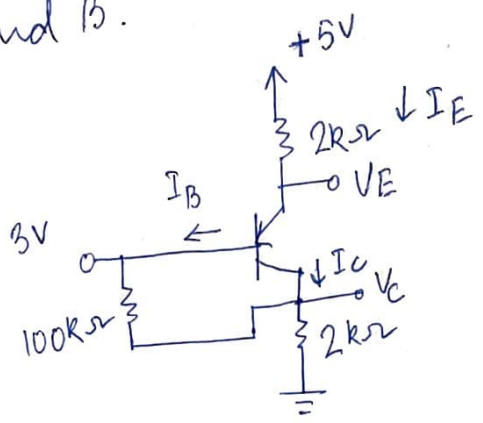


Q6) For the given circuit, the base voltage was measured to be 0.8 V. Assuming $|V_{BE}| = 0.7V$, calculate the following quantities:

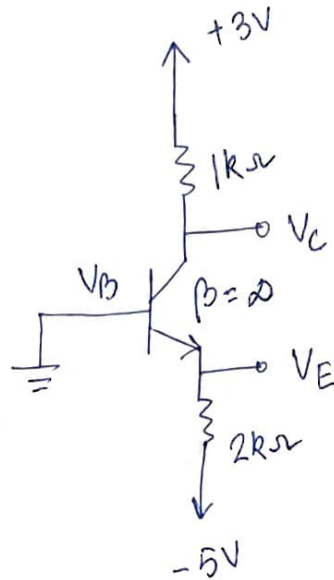
- Emitter voltage (V_E)
- Collector voltage (V_C)
- Base current (I_B)
- Collector current (I_C)
- Emitter current (I_E)
- Common emitter current gain (β)
- Common base current gain (α)



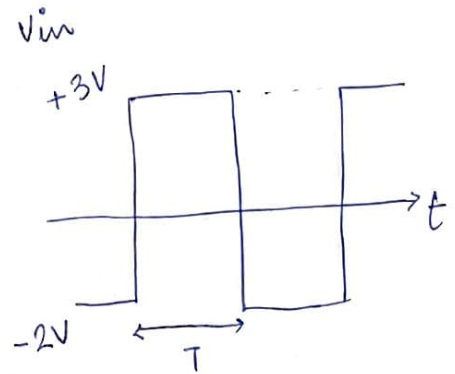
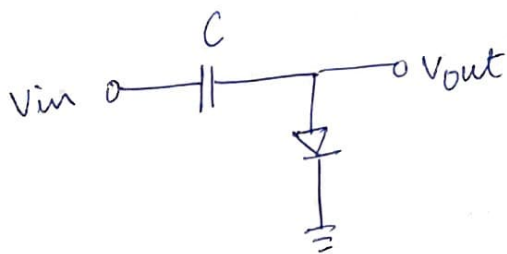
Q7) For the given circuit, assume $|V_{BE}| = 0.7V$. Calculate I_B , V_C , α and β .



Q 8) For the given circuit, $V_{BE} = 0.7 \text{ V}$. Determine the region of operation for the transistor.



Q 9) For the circuit below assume the diode to be ideal. Sketch the output voltage for the given input. Assume $RC \gg T$.



Q 10) For a pnp transistor, the following terminal voltages are measured. Identify the modes of operation.

Case 1: $V_E = 6 \text{ V}$, $V_B = 5 \text{ V}$, $V_C = -2 \text{ V}$

Case 2: $V_E = +4 \text{ V}$, $V_B = +3 \text{ V}$, $V_C = -4 \text{ V}$

Case 3: $V_E = 8 \text{ V}$, $V_B = 6 \text{ V}$, $V_C = 7 \text{ V}$