

# Analog and Digital Systems (UEE505)

## Lecture #3 Transistor Biasing Circuits-II

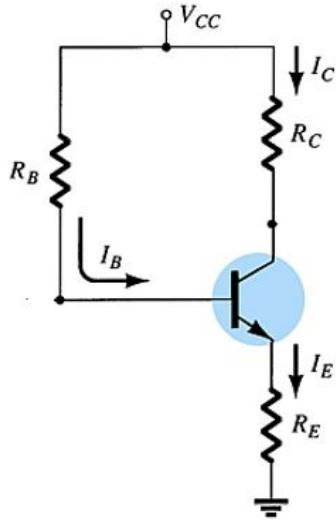


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# Emitter-Stabilized Bias Circuit

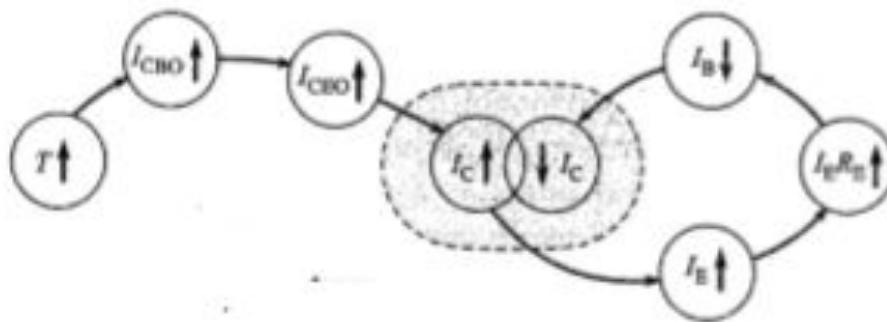
Analysis : Apply KVL to the input as well as to output circuit



**Transistor Saturation Current:**

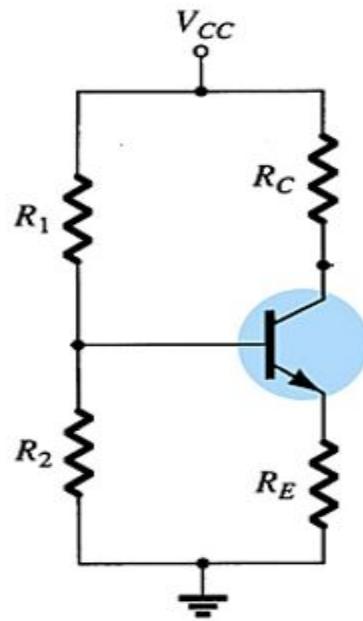
# Emitter-Stabilized Bias Circuit

- **Advantage:** Provides some stabilization of Q point.



- **Disadvantage:** Requires more components than collector-feedback bias.

# Voltage Divider Bias Circuit



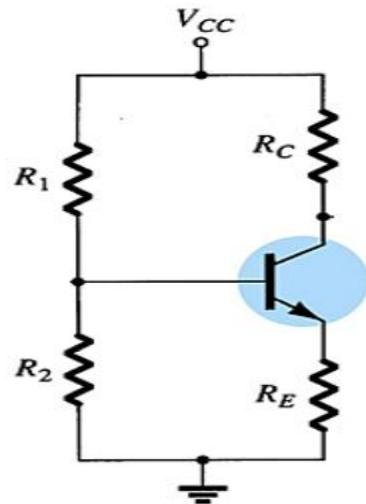
Approximate Analysis : where  $\beta R_E > 10R_2$

Transistor Saturation Current:

# Voltage Divider Bias Circuit

**Accurate Analysis:**

Apply Thevenin Theorem on left of the terminals AB:



# Voltage Divider Bias Circuit

- **Advantage:** More stable Q pt against variation in  $\beta$  of transistor.
- **Disadvantage:** Requires more components than other biasing circuits.

# Example

Find the accurate value of collector current and collector emitter voltage for voltage divider bias circuit. Take  $V_{BE} = 0.3V$ .

# References

- Boylestad R. L., Electronic Devices and Circuit Theory, Pearson Education.
- *NN Bhargava, DC Kulshreshtha and SC Gupta, Basic Electronics and Linear Circuits*, McGraw Hills.