

UNIT-II

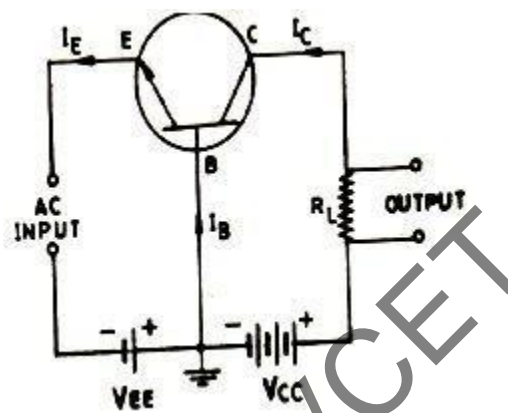
1. Calculate  $\beta$  of a transistor when  $\alpha = 0.98$

$$\beta = \alpha / (1 - \alpha) = 0.98 / (1 - 0.98) = 49$$

2. Among CE, CB and CC configurations, which one is the popular? Why?

→ The CE configuration is widely used because it provides both voltage gain as well as current gain greater than unity.

3. Draw the circuit of NPN transistor in CB configuration?



4. What are power transistors? List its applications.

→ Power transistors are designed for power amplification which means that the operating voltage and current must be large.

Applications:

1. They are used in switching power supplies.
2. They are used in audio power amplifiers.

5. What is the relation between  $I_B$ ,  $I_E$  and  $I_C$  in CB configuration?

$$\text{Emitter current } I_E = I_B + I_C$$

6. Name the operating modes of a transistor?

1. Cut off
2. Active
3. Saturation

### 7. What are hybrid parameters

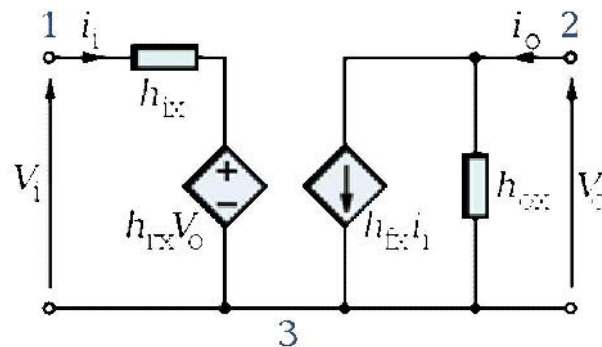
$$h_{11} = V_i / I_i | V_0 = 0 \quad h_{21} = I_o / I_i | V_0 = 0$$

$$h_{12} = V_i / V_o | I_o = 0 \quad h_{22} = I_o / V_o | I_i = 0$$

### 8. What is the application of optocoupler?

→ The application of optocoupler is to provide electrical isolation between input and output circuit.

### 9. Draw the h-parameter equivalent circuit of a CE BJT configuration?



### 10. Give the $h_{ie}$ and $h_{oe}$ equations of BJT

$$h_{ie} = \left. \frac{V_{BE}}{I_B} \right|_{V_{CE} \text{ Constant}}$$

$$h_{oe} = \left. \frac{I_c}{V_c} \right|_{I_B \text{ Constant}}$$

### 11. When does a transistor acts as a switch?

The transistor acts as a switch when it is operated at either cutoff region or saturation region.

### PART-B

1. Compare the following. DMOSFET & EMOSFET (8)
2. N-channel MOSFET & P-channel MOSFET. (8)
3. Explain the biasing technique for JFET. (16)
4. Explain the construction and characteristics of JFET. (16)
5. Explain the construction and characteristics of EMOSFET. (16)
6. Explain the construction and characteristics of DMOSFET. (16)
7. Explain the biasing characteristics of MOSFET. (16)
8. Explain the working and principle of operation of UJT and mention its applications. (16)

10. Briefly explain the operation of DIAC (8)
11. Briefly explain the operation of TRIAC (8)
12. Explain the principle and operation of bidirectional switch(16)

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