

XIII Precautions

XIV Observations and Calculations

Calculation of input resistance at any point-

Calculation of input resistance at any point-

Calculation of current gain -

Table 1: Input Characteristics

Sr.No.	Vcb = V		Vcb = V		VCB = V	
	VEB (V)	I _E (mA)	VEB (V)	I _E (mA)	VEB (V)	I _E (mA)
1	0.02	77	0.02	38		
2	0.72	79	0.48	39		
3	1.22	81	0.74	40		
4	1.56	83	0.98	40		
5	1.86	87	1.56	44		
6	2.0	89	2.0	50.		

Table 2: Output Characteristics

Sr.No.	$I_E = 3.00 \text{ mA}$		$I_E = 6.3 \text{ mA}$		$I_E = 1.3 \text{ mA}$	
	Vcb (V)	Ic (mA)	Vcb (V)	Ic (mA)	Vcb (V)	Ic (mA)
1	0.72	1.84	0.2	1.2	0.4	4.8
2	1.02	2.29	0.6	3.3	0.9	9.17
3	1.42	2.65	1.3	5.40	1.6	11.81
4	4.42	2.98	5.3	6.27	6.1	12.81
5	6.52	2.98	7.5	6.27	7.5	12.81
6	9.02	2.98	8.5	6.27	8.0	12.81

XV Results

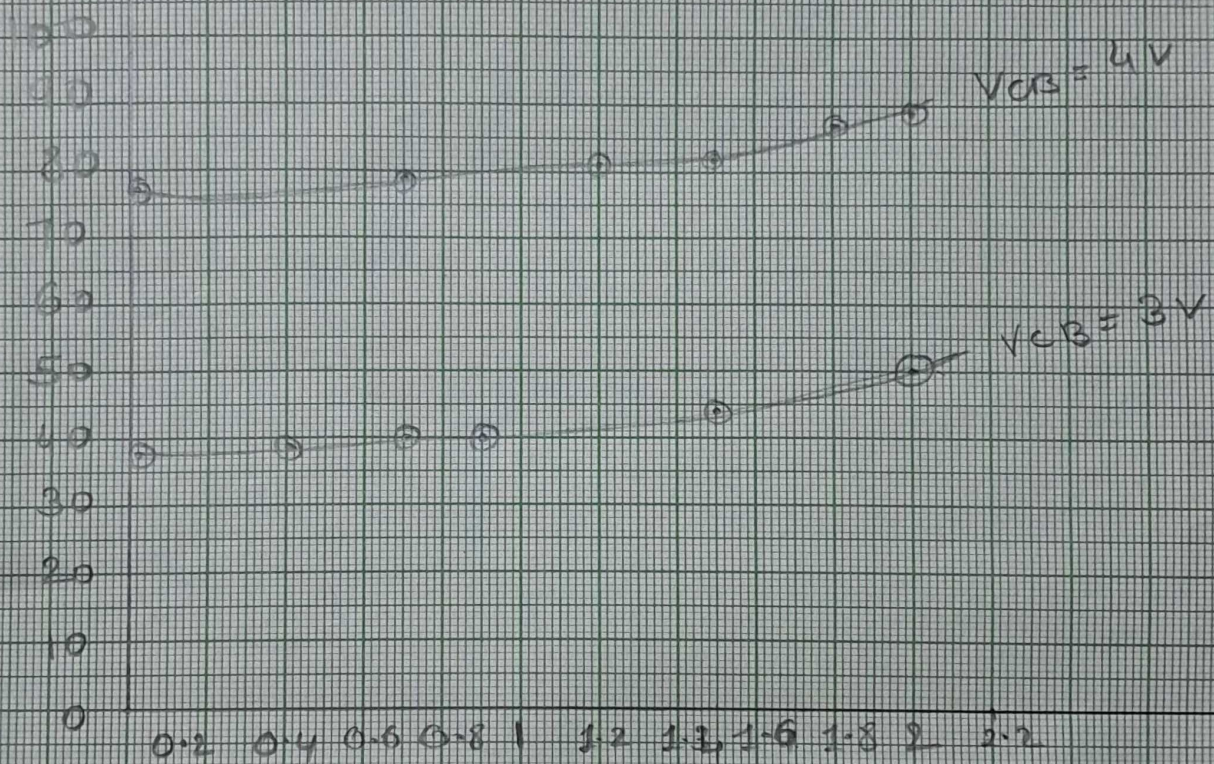
1. Input resistance $r_i = \dots \text{ohm}$
2. Output resistance $r_o = \dots \text{ohm}$
3. Current amplification factor $\alpha = \dots$

XVI Interpretation of results (Give meaning of the above obtained results)**XVII Conclusions** (Actions/decisions to be taken based on the interpretation of results).**XVIII Practical related Questions**

1. Define current amplification factor α ?
2. Write equation of α in terms of β .
3. What is the value of α ranges from?
4. If $I_c = 2.05 \text{ mA}$ and $I_b = 2.05$ find α and β ?
5. Output characteristics of CB have how many regions?

scale x axis = 1 cm = 0.5
y axis = 1 cm = 5

Scale
on x axis:
1 cm = 0.2 cm
units
on y axis:
1 cm = 10 units



scale $V_{CE} = 1 \text{ cm} = 0.5 \text{ V}$
 $I_E = 1 \text{ cm} = 5 \text{ mA}$

saturation
region

$I_E = 12 \text{ mA}$

Output
 V_I

$I_E = 6.3 \text{ mA}$

$I_E = 3 \text{ mA}$

Cut off
region

0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9
 V_{CE}



Questions.

1. Define current amplification factor alpha?

→ The ratio of the change in the collector current (ΔI_C) to the change in emitter current (ΔI_E) at a constant base-collector voltage (V_{CB}).

$$\alpha = \Delta I_C / \Delta I_E.$$

2. What write equation of alpha in terms of beta.

$$\rightarrow \alpha = \frac{I_C}{I_E}$$

in term of Beta

$$\alpha = \frac{\beta}{1+\beta}$$

3. What is the value of alpha ranges from?

→ Alpha ranges from 0.95 to 0.99
It is always less than 1.

4. If $I_C = 2.05 \text{ mA}$ & $I_B = 2.05$ find alpha & Beta.

$$\rightarrow \beta = \frac{I_C}{I_B} = 2.05 / 2.05$$

$$\boxed{\beta = 1}$$

$$\alpha = \beta / (1+\beta)$$

$$= 1 / (1+1)$$

$$= 1/2$$

$$\boxed{\alpha = 0.5}$$

5. Output characteristics of CB have how many regions?

→ There are 3 regions in Output characteristics of CB.