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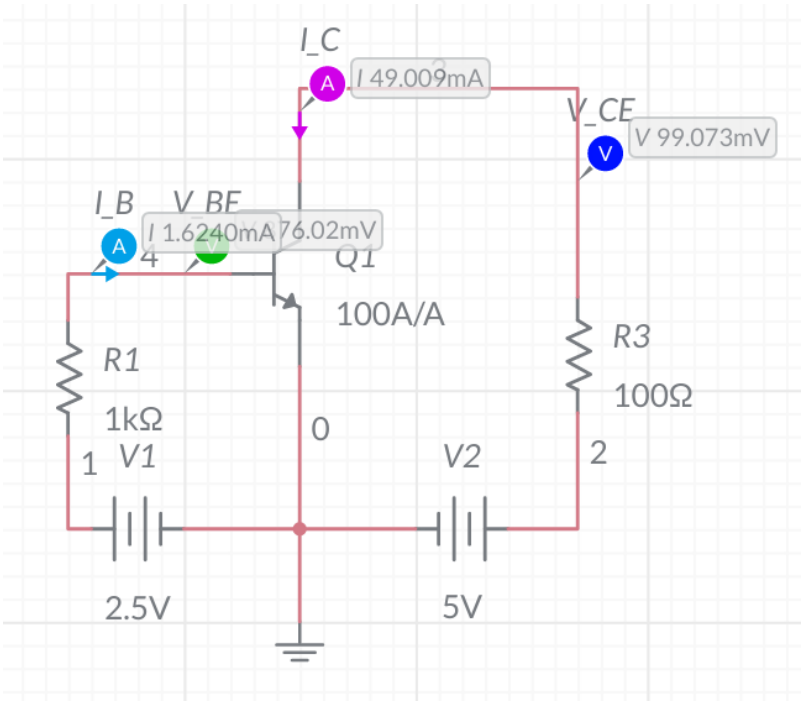
PHY366 Lab Report
Practical: 7 Registration No.: 11912610 Section: G2903

Aim

To study the input/output characterisitics and frequency response of a Common Emitter (CE) amplifier.

Methods

We simulated a transistor circuit biased in the common emitter configuration and first characterized the input and output characteristics of the transistor.



The circuit for input/output characterisation can be found at https://www.multisim.com/content/pEMRiTJNNADTw8LLDJV9pF/common-emitter-transistor-characteristics/open/.

Results & Conclusions

We summarize the I/O characteristics below.

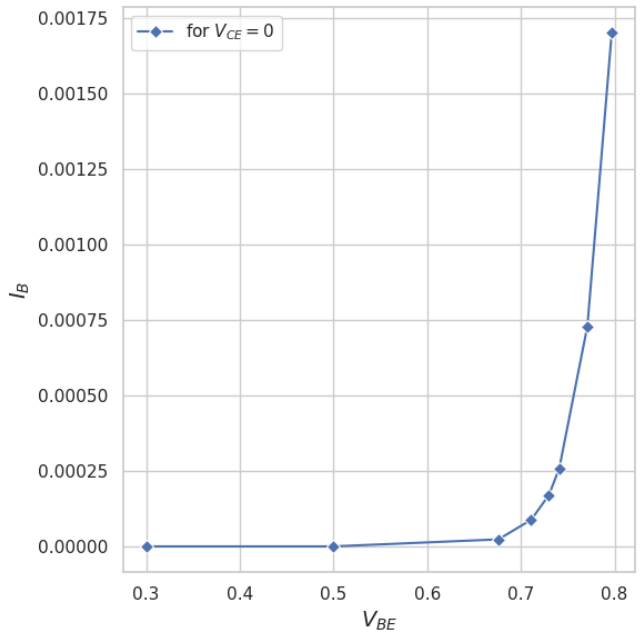


Figure 1: Input characteristics of a CE transistor for $V_{CE} = 0$.

As expected, the input characteristics show the behavior of a pn-junction diode, with an exponentially increasing I_B with V_{BE}. This is illustrated in Figure 1.

V_{CE} (Volts)	I_C (mA)
0	-0.166.04
1	9.45
2	19.29
3	29.177
5	49.0
10	98.68
12	118.53
13	128.44
15	148.14
20	159.46
100	159.46

Table 1: Observations of the output characteristics taken at $I_B = 1.6$ mA.

We enumerate the measurements of the output characteristics in Table 1. Clearly, the output voltage saturates at $V_{CE} = 20$ V. This is shown in Figure 2.

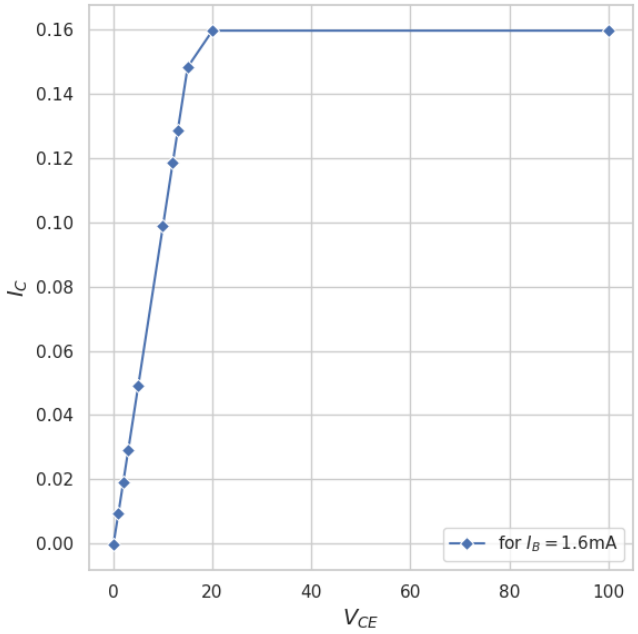


Figure 2: Output characteristics for the described CE configuration, at constant base current $I_B = 1.6$ mA.