

Sir Syed University of Engineering & Technology (SSUET)

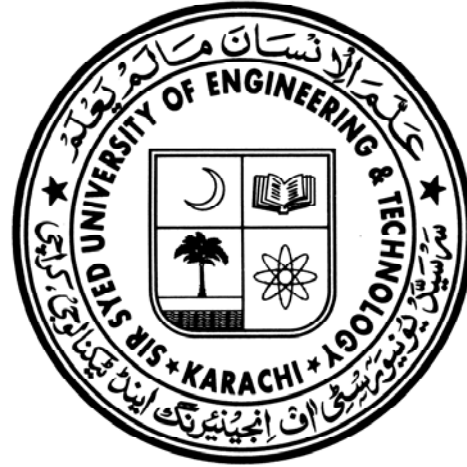
Computer Engineering Department

Course Name: Basic Electronics

Semester: Spring 2011, 3rd

Batch: 2010(Sections: A,B)

Assignments # 6



Course Responsible

Syed Hassan Raza Naqvi

Assistant Professor,
Computer Engineering Department
Office: STI,

SIR SYED UNIVERSITY OF ENGINEERING AND TECHNOLOGY
COMPUTER ENGINEERING DEPARTMENT
BASIC ELECTRONICS
2010 BATCH (Sections: A, B)
Last Submission Date: 11th May, 2011.

Assignment # 6

Q1. For the fixed-bias configuration of Fig. 4.1, determine:

- (a) I_{BQ} .
- (b) I_{CQ} .
- (c) V_{CEQ} .
- (d) V_C .
- (e) V_B .
- (f) V_E .

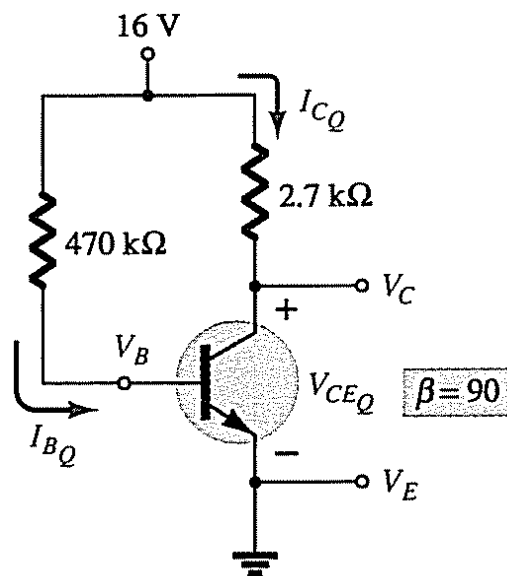


Figure 4.1 Problems 1, and 4.

Q2. Given the information appearing in Fig. 4.2, determine:

- (a) I_C .
- (b) R_C .
- (c) R_B .
- (d) V_{CE} .

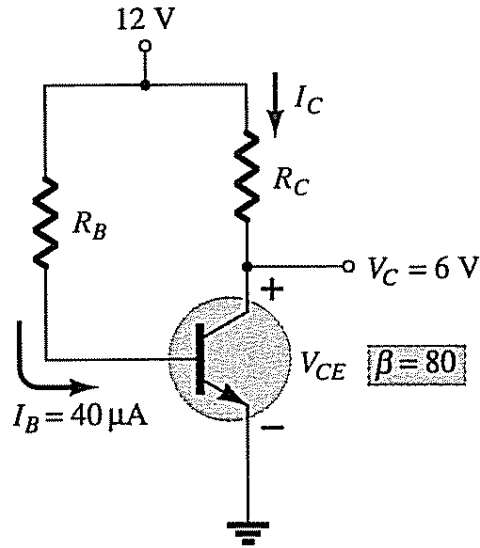


Figure 4.2 Problems 2.

Q3. Given the information appearing in Fig. 4.3, determine:

- (a) I_C .
- (b) V_{CC} .
- (c) β .
- (d) R_B .

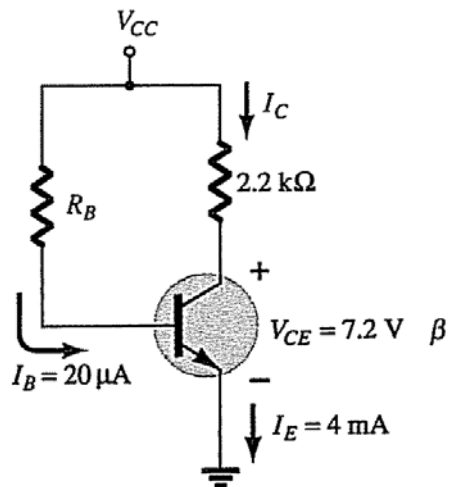


Figure 4.3 Problems 3.

Q4. Find the saturation current ($I_{C_{sat}}$) for the fixed-bias configuration of Fig. 4.1.

Q5. Given the BJT transistor characteristics of Fig. 4.4:

- (a) Draw a load line on the characteristics determined by $E = 21\text{ V}$ and $R_C = 3\text{ k}\Omega$ for a fixed-bias configuration.
- (b) Choose an operating point midway between cutoff and saturation. Determine the value of R_B to establish the resulting operating point.
- (c) What are the resulting values of I_{CQ} and V_{CEQ} ?
- (d) What is the value of β at the operating point?

- (e) What is the value of α defined by the operating point?
- (f) What is the saturation (I_{Csat}) current for the design?
- (g) Sketch the resulting fixed-bias configuration.
- (h) What is the dc power dissipated by the device at the operating point?
- (i) What is the power supplied by V_{CC} ?
- (j) Determine the power dissipated by the resistive elements by taking the difference between the results of parts (h) and (i).

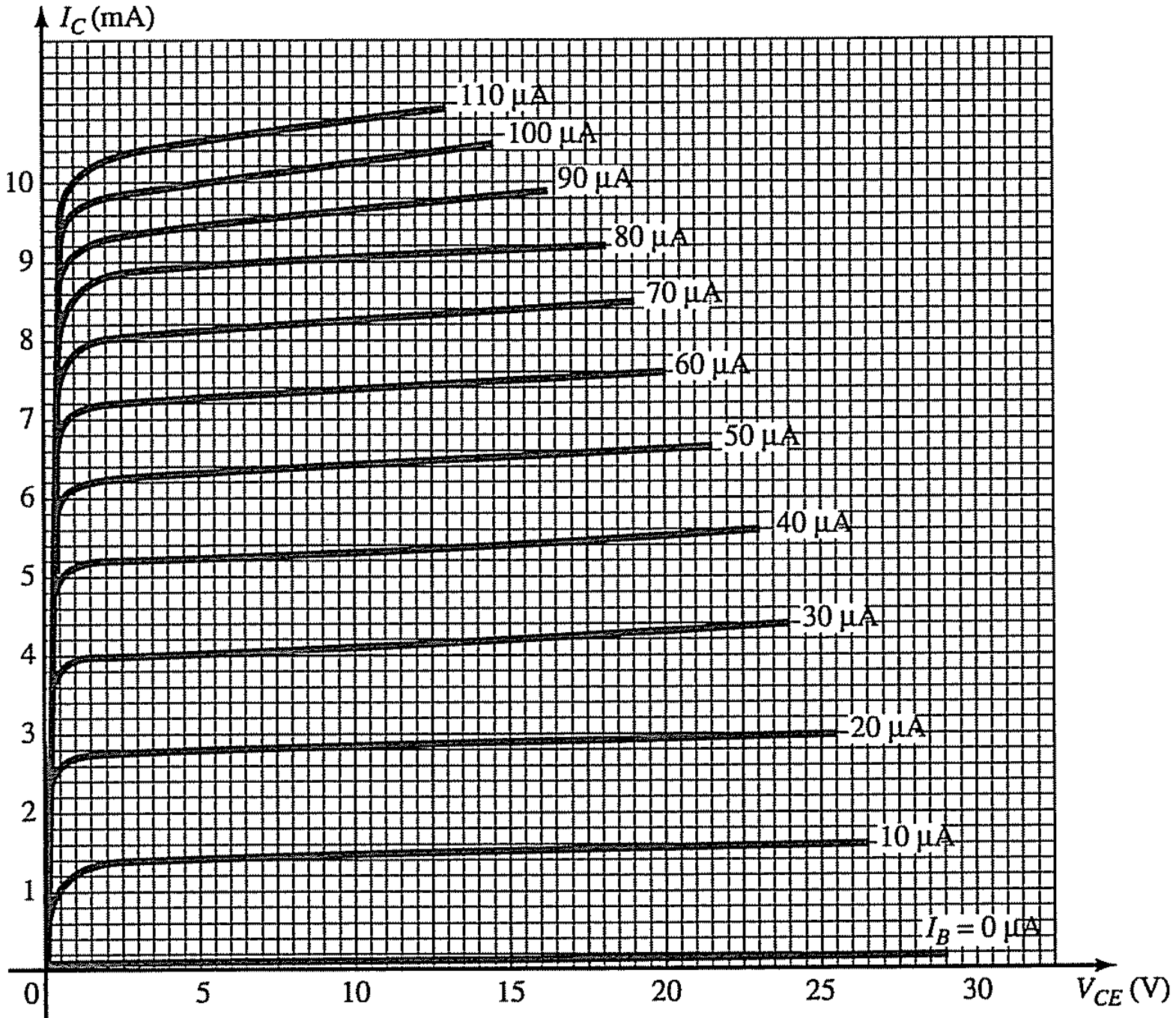


Figure 4.4 Problems 5.