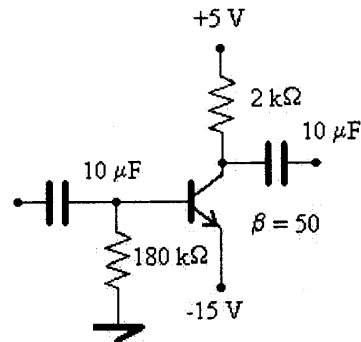**Baskent University, Faculty of Engineering**
BME 222-01 – Electronics (Spring Semester 2004/2005)
Quiz 2 – April 25, 2005
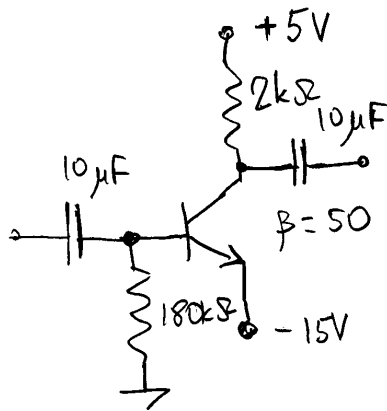
Student Name_____

Faculty No: _____

For the fixed-bias circuit determine: I_B, I_{CQ}, V_{CEQ}, V_B, V_C, V_{BC}.

6 points.
Good Luck!

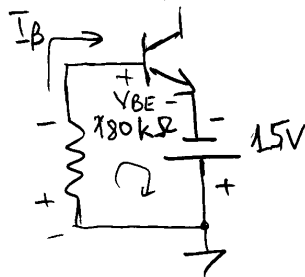For the fixed-bias circuit
determine: I_B, I_{CQ}, V_{CEQ},
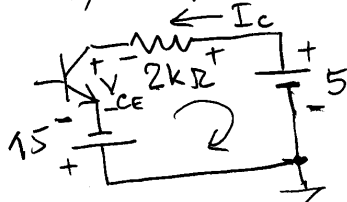V_B, V_C, V_{BC}

(6 points)

Solution

1). Input section

$I_B \cdot R_B + V_{BE} - 15 = 0$; $V_{BE} = 0.7V$

$$I_B = \frac{15-0.7}{R_B} = \frac{14.3}{180 \cdot 10^3} = 0.079 \cdot 10^{-3} =$$

$$\boxed{= 79 \, \mu A}$$

2). $I_{CQ} = \beta I_B = 50 \cdot 79 \cdot 10^{-6} = 3950 \cdot 10^{-6} =$

$$\boxed{= 3.95 \, mA}$$

3). Output section

$15 - V_{CEQ} - I_c R_e + 5 = 0$

$V_{CEQ} = 20 - I_c R_e = 20 - 3.9510^{-3} \cdot 2 \cdot 10^3 =$

$$= 20 - 7.9 = \boxed{12.1 \, V}$$

4. $V_B = -I_B R_B = -79 \cdot 10^{-6} \cdot 180 \cdot 10^3 = -14.220 \cdot 10^{-3} = \boxed{-14.22 V}$

5. $V_C = V_E + V_{CE} = -15 + 12.1 = \boxed{-2.9 \, V}$

6. $V_{BC} = V_B - V_C = -14.22 - (-2.9) = \boxed{-11.32 \, V}$