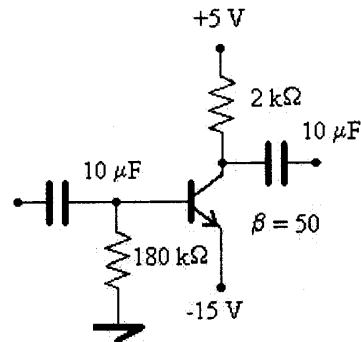


Baskent University, Faculty of Engineering
BME 222-01 – Electronics (Spring Semester 2004/2005)
Quiz 2 – April 25, 2005

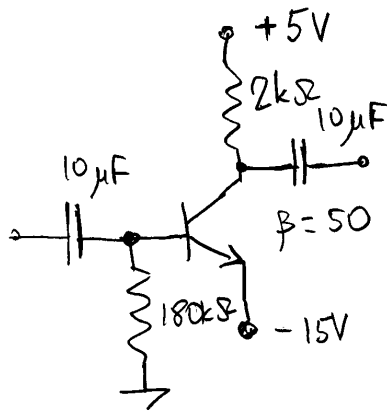
Student Name _____

Faculty No: _____



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

6 points.
Good Luck!

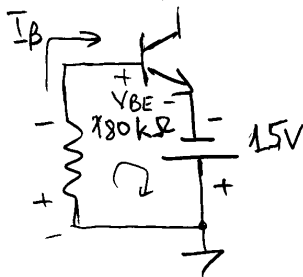


For the fixed-bias circuit
determine: I_B , I_{CQ} , V_{CEQ} ,
 V_B , V_C , V_{BC}

(6 points)

Solution

1). Input section

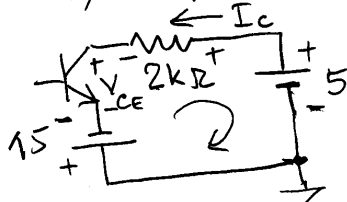


$$I_B \cdot R_B + V_{BE} - 15 = 0 \quad ; \quad V_{BE} = 0.7V$$

$$I_B = \frac{15 - 0.7}{R_B} = \frac{14.3}{180 \cdot 10^3} = 0.079 \cdot 10^{-3} = 79 \mu A$$

2). $I_{CQ} = \beta I_B = 50 \cdot 79 \cdot 10^{-6} = 3950 \cdot 10^{-6} = 3.95 \text{ mA}$

3). Output section



$$15 - V_{CEQ} - I_C R_C + 5 = 0$$

$$V_{CEQ} = 20 - I_C R_C = 20 - 3.95 \cdot 10^{-3} \cdot 2 \cdot 10^3 = 20 - 7.9 = 12.1 \text{ V}$$

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

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

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