BJT Biasing Numericals

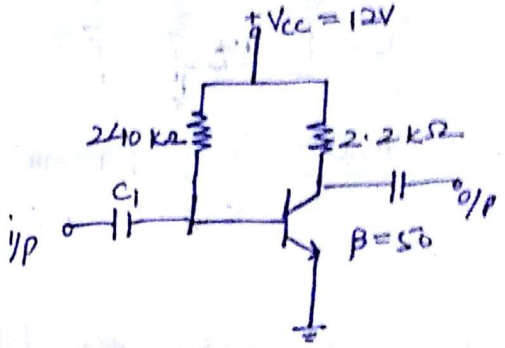
Module - II

Tutorial sheet - II

Q.1: Determine the following parameters for fixed bias configuration (fig 1)

a) I_B, I_C b) V_{CEQ} c) V_B & V_C

Assume $V_{BE} = 0.7\,V$

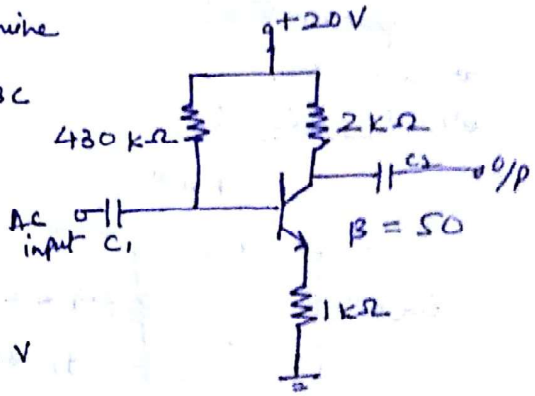


Ans: $I_B = 47.08\,\mu A$, $I_C = 2.35\,mA$

$V_{CE} = 6.83\,V$, $V_B = 0.7\,V$, $V_C = 6.83\,V$

Q.2: for the Emitter bias network determine

a) I_B & I_C, b) V_{CE}, V_C, V_B c) V_{BC}



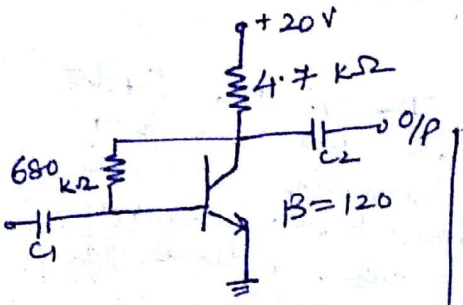
Ans: $I_B = 40.12\,\mu A$

$I_C = 2.006\,mA$

$V_{CE} = 13.94\,V$ | $V_B = 2.74\,V$

$V_C = 15.98\,V$ | $V_{BC} = -13.24\,V$

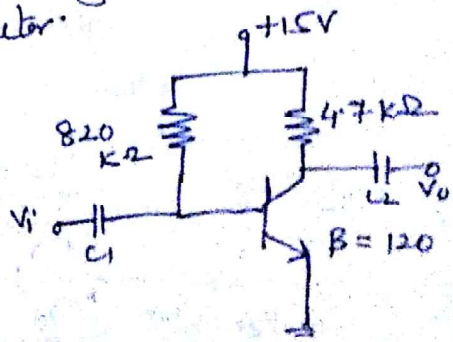
Q.3: for the given network determine the (i) Q-pt Co-ordinates (ii) V_B, V_E, V_{BC}



Ans: $I_C = 1.86\,mA$, $V_{CE} = 11.26\,V$

$V_B = 0.7\,V$, $V_E =$ ~~0.7V~~ 0V, $V_{BC} =$ ~~-10.56~~ -10.56 V

Q.4: Draw DC load line and locate operating point for the given network. Also find stability factor.



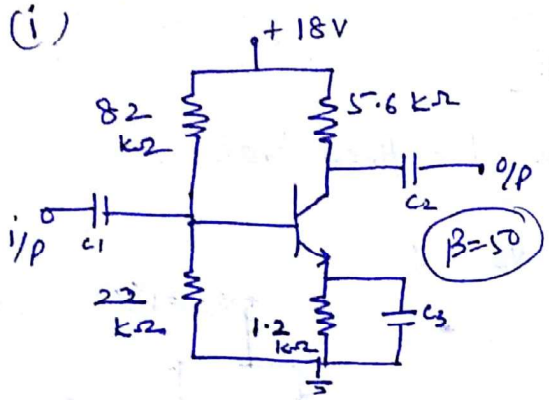
$I_C = 2.096\,mA$

$V_C = 5.165\,V$

$S = 12.1$

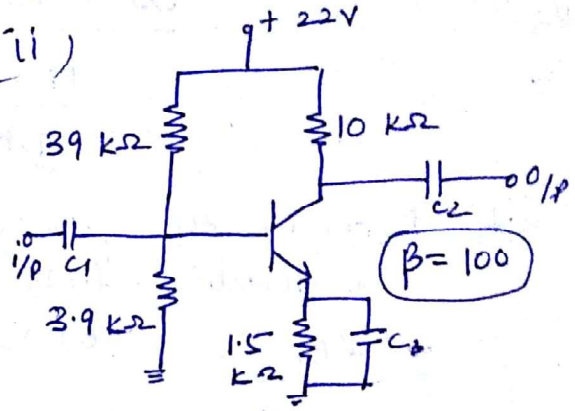
Q.5: Determine Q-pt (I_{CQ}, V_{CEQ}) for VDB network.

(i)



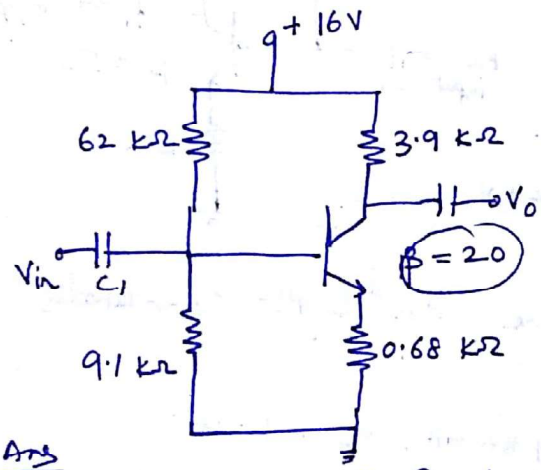
Ans: $I_{CQ} = 1.98$ mA
$V_{CQ} = 4.54$ V

(ii)



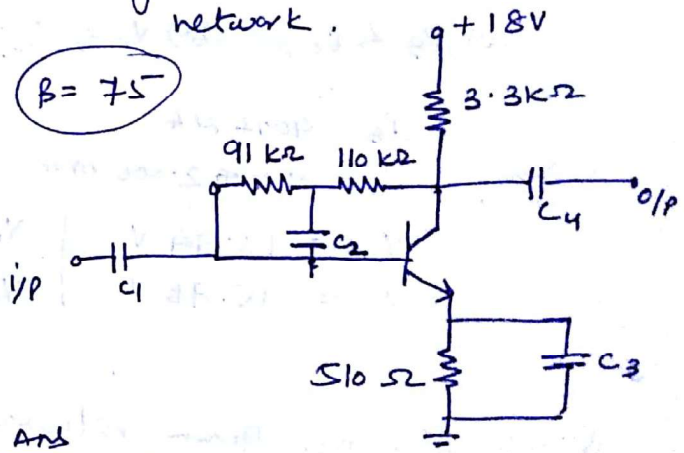
Ans $I_{CQ} = 0.85$ mA
$V_{CE} = 12.22$ V

Q.6: Determine the following parameters:
a) I_B, I_C,
b) V_{CE}, V_E, V_C



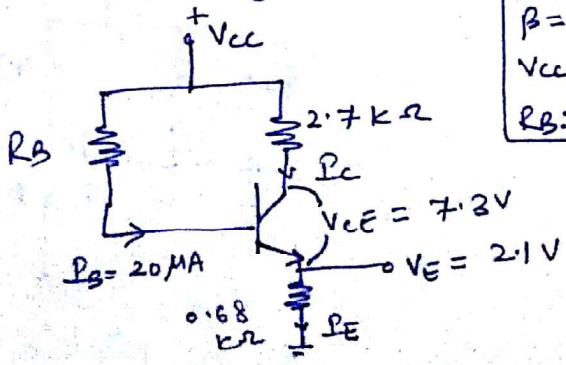
Ans
$I_B = 60.63$ MA, $I_C = 1.212$ mA
$V_{CE} = 10.45$ V, $V_C = 11.28$ V, $V_E = 0.824$ V.

Q.7 Determine the DC level of I_B, V_C for the given network.



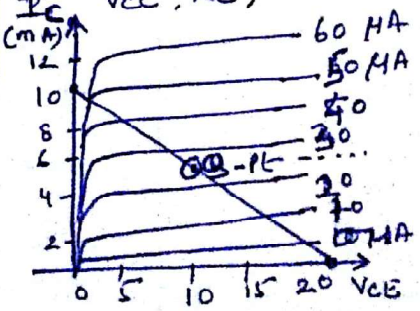
Ans
I_B =
$V_C = 9.22$ V

Q.8: find β, V_{CC}, R_B for the given circuit



Ans:
β = 15 3.4
$V_{CC} = 17.68$V
$R_B = 744$ kΩ

Q.9: The o/p characteristics with load line & Q-pt for fixed bias network is given below. Determine the required levels of V_{CC}, R_C, R_B.



Ans:
$V_{CC} = 20$V
$R_C = 2$ kΩ
$R_B = 772$ kΩ