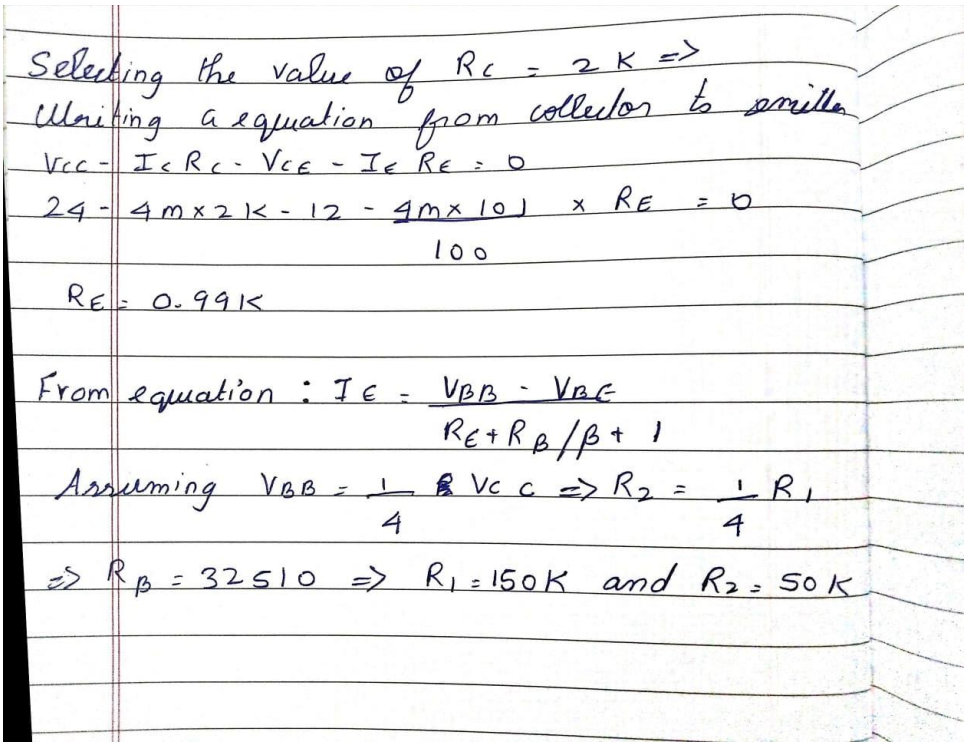
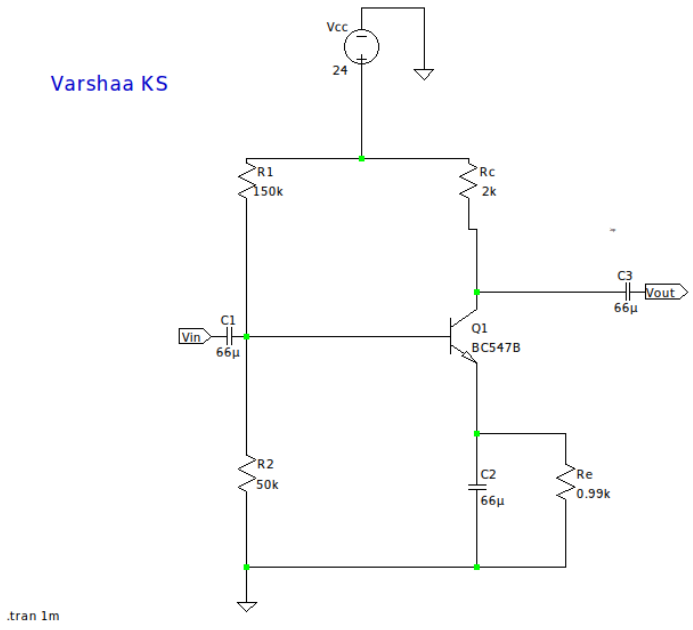
a) How you obtain the values of R1 , R2, Rc and RE from the given specifications? Attach the scanned copy of the theoretical solution for this?

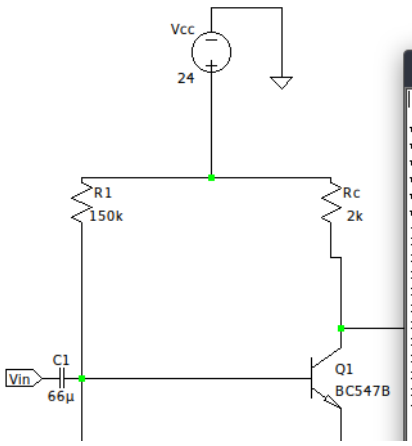


b)Attach the screenshot of the LT-spice schematic diagram of the designed circuit?



c)Attach the screenshot of voltages and currents obtained by performing DC Op simulation?

Varshaa KS

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* C:\users\anjali\Desktop\lt\Draft8.asc

        --- Operating Point ---

V(n001):      24             voltage
V(n002):      16.0063        voltage
V(n003):      4.66476        voltage
V(n004):      3.99214        voltage
V(vout):      0.00105635     voltage
V(vin):       0.000307854    voltage
Ic(Q1):       0.00399685     device_current
Ib(Q1):       3.56064e-005   device_current
Ie(Q1):       -0.00403246    device_current
I(C1):        3.07854e-016   device_current
I(C3):        -1.05635e-015                 device_current
I(C2):        2.63481e-016   device_current
I(Re):        0.00403246     device_current
I(R2):        9.32952e-005   device_current
I(R1):        0.000128902    device_current
I(Rc):        0.00399685     device_current
I(Vcc):       -0.00412576    device_current
```

d) How does capacitors behave in DC-operation?

At DC operation, the frequency of the signal is 0 and hence the capacitor acts as open circuits.

e) Comment on the specification given as R2 ≤ (βRE)/10?

This is done so as to decrease Ib as much as possible. Because of this, the current through the collector is nearly identical to the current through the emitter.

f) How do you justify the statement "BJT is operating in active mode" from the simulation results?

From the operating point table we obtained via the simulation, we can see that Ic/Ib (beta) is nearly 100. If the BJT was operating in the saturation mode, the beta value or Ic/Ib will be far less than 100.

E) Draw the frequency response of a CE amplifier and explain why does it look like that?

At low frequencies of operation, the gain falls off due to the effects of the coupling and bypass capacitors. At high frequencies of operation, the gain falls due to internal parasitic capacitances of the BJT. There is a set of frequencies from Fl to Fh where the effects of both of these capacitances are minimal and the gain remains more or less constant.