1. Find the transistor(211,21),(799,702) current in the circuit shown below if $I_{CO} = 20\text{nA}$, $\beta = 100$.

2. Determine the Q-point for the CE amplifier given in figure, if $R_1 = 1.5\text{K}\Omega$ and $R_2 = 7\text{K}\Omega$. A 2N3904 transistor is used with $\beta = 180$, $R_E = 100\Omega$ and $R_C = R_{load} = 1\text{K}\Omega$. Also determine the $P_{out}(ac)$ and the dc power delivered to the circuit by the source.

3. In potential divider bias circuit, what will happen if –
   (a) Resistance $R_2$ is shorted
   (b) Resistance $R_2$ is open
   (c) Resistance $R_1$ is shorted
   (d) Resistance $R_1$ is shorted
4. Design a common emitter amplifier circuit that has a load resistance \( (R_c) \) of 1.2kohm and a supply voltage of 10V. Also find the value of the Emitter resistor, \( R_E \) with a voltage drop of 1V across it. Calculate the values of all the other circuit resistors assuming an NPN silicon transistor.

5. Calculate the value of stability factor for the above mentioned CE amplifier and give your feedback to further improve the stability, if needed.

6. Develop a program in any programming language (MATLAB or C or C++) to design a CE amplifier and to check the stability.