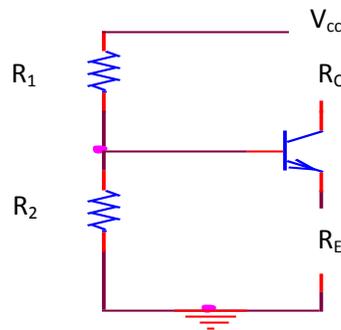


UNIT I**PART –A**

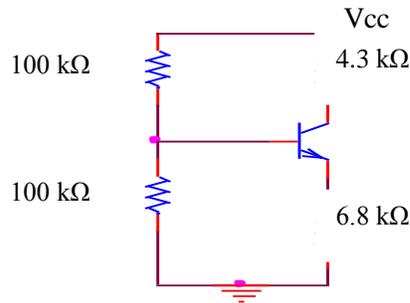
1. Define - Stability Factor
2. Compare bias stabilization and compensation techniques
3. What is the condition for thermal stability?
4. What are the different methods of biasing JFET?
5. What are the types of transistor biasing?
6. Draw the single stage self biased circuit using pnp transistor.
7. List the advantages of self bias.
8. Draw the fixed bias and the self bias circuits.
9. What is the need for biasing in transistor amplifier?
10. What is reverse saturation current?
11. Why is capacitive coupling used to connect a signal source to an amplifier?
12. Calculate the value of feedback resistor (R_s) required to self bias an N-channel JFET with $I_{DSS}=40\text{mA}$, $V_P = -10\text{V}$ and $V_{GSQ} = -5\text{V}$.
13. What is DC load line? How is Q point plotted on the DC load line?

PART – B

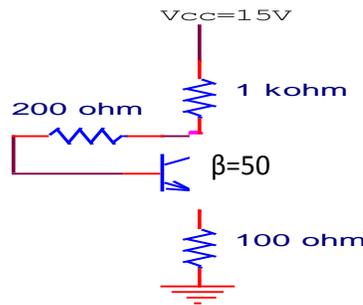
1. Explain fixed biasing in BJT and FET. Explain the procedure for locating operating point on the characteristic curves.(16)
2. Explain the fixed bias method and derive an expression for the stability factor.(8)
3. The following circuit has $V_{CC} = 20\text{V}$, $R_C = 2\text{K}\Omega$, $\beta = 50$, $V_{BE} = 0.2\text{V}$, $R_1 = 100\text{K}\Omega$, $R_E = 100\Omega$. Calculate I_B , V_{CE} , I_C and the Stability Factor S. (16)



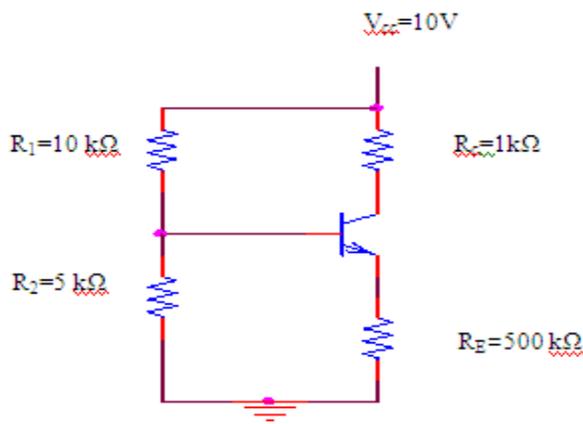
4. Draw a voltage divider bias BJT network. Derive expressions for I_{CQ} and V_{CEQ} and describe the method of drawing the dc load line on the output characteristics of transistor. (16)
5. Explain the voltage divider bias method and derive an expression for the stability factor. (8)
6. For the following circuit find the Q-point if $V_{CC} = 15\text{V}$ and $\beta = 100$; $V_{BE} = 0.7\text{V}$. (10)



7. A silicon transistor with $\beta = 49$ is used in self bias arrangement with $V_{CC} = 5V$, $R_E = 1Kohms$ and $I_E = 1mA$. Find the values of R_1 and R_2 such that the stability factor does not exceed 5. (10)
8. In an N-channel JFET, biased by potential divider method, the operating point has to be at $I_{DSS} = 12mA$. If $V_{DD} = 12V$, $R_1 = 20K \Omega$ and $R_2 = 10K \Omega$, $R_D = 1.2K \Omega$ and $V_P = -4V$. Find the values of I_D , V_{GS} , V_G , V_{DS} and V_S . (16)
9. Calculate the operating point for the following circuit.(6)



10. For the following circuit calculate V_{CE} and I_C , where $\beta = 100$ for the silicon transistor.



11. Derive the expression of stability factor for collector feedback amplifier. (10)
12. Explain the circuit that uses a diode to compensate the changes in V_{BE} and in I_{CO} .(12)
13. Explain the operation of thermistor compensation. (4)
14. Explain the various techniques of stabilization of Q-point in a transistor. (16)

15. Explain the factors on which an amplifier needs to be stabilized. (6)
16. With the help of neat diagram, explain the methods used in biasing the FET and MOSFET. (16)
- (i) Define - Stability Factor. (2)
- (ii) The pnp transistor in the following circuit has $\beta = 50$. Find the values of R_C to obtain $V_C = 5V$. What happens if the transistor is replaced with another transistor $\beta = 100$? (14)

