



PART - B

(5×16=80 Marks)

11. a) For the circuit shown in Figure 1, the parameters are $R_1 = 150 \text{ k}\Omega$, $R_2 = R_3 = 47 \text{ k}\Omega$, $R_4 = 33 \text{ k}\Omega$, $R_{C1} = 10 \text{ k}\Omega$, $R_{C2} = 4.7 \text{ k}\Omega$, $R_{E1} = R_{E2} = 4.7 \text{ k}\Omega$, $h_{ie} = 1.1 \text{ k}\Omega$, $h_{fe} = 50$, $R_{F2} = 4.7 \text{ k}\Omega$ and $R_{F1} = 100\Omega$. Determine the value of voltage gain, input impedance and output impedances by considering with and without feedback. (16)

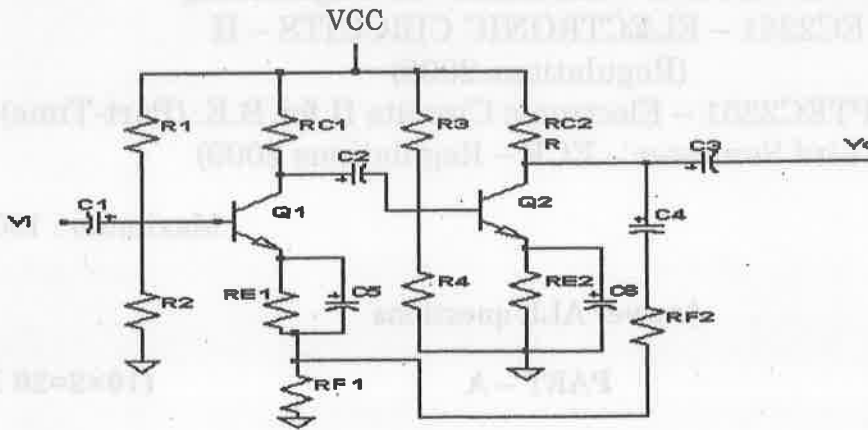


Figure.1

(OR)

- b) i) Determine the required feedback transfer function β to yield a specific phase margin. Consider a three pole feedback amplifier with a loop gain function given by :

$$T(f) = \frac{\beta (100)}{\left(1 + j \frac{f}{10^3}\right) \left(1 + j \frac{f}{5 \times 10^4}\right) \left(1 + j \frac{f}{10^6}\right)}$$

Determine the value of β that yields a phase margin of 45 degrees. (8)

- ii) Compare the four types of feedback amplifiers in terms of its voltage gain, input and output impedances. (8)

12. a) i) With neat circuit diagram, explain and derive the frequency of oscillations of a Hartley oscillator. (8)

- ii) With neat circuit diagram, explain the audio frequency oscillator which has lead-lag network in its feedback path. (8)

(OR)



b) i) With neat circuit diagram, explain and derive the frequency of oscillations of a RC phase shift oscillator. Also derive the minimum h_{fe} required to get sustained oscillation. (12)

ii) Write short notes on crystal oscillators. (4)

13. a) i) Explain in detail, how the stability is achieved in tuned amplifiers using neutralization techniques. (8)

ii) What is synchronous tuning? Derive the bandwidth relationship of cascaded synchronously tuned amplifiers. (8)

(OR)

b) i) With neat circuit, explain and derive the Q factor, Centre frequency gain, resonant frequency and bandwidth of single tuned amplifier. (12)

ii) Write short notes on stagger tuned amplifier. (4)

14. a) i) With neat circuit diagram, explain and derive the frequency of oscillation of collector coupled free running oscillator. (10)

ii) Discuss about clippers and clampers. (6)

(OR)

b) i) With neat circuit, explain the working principle of schmitt trigger. (6)

ii) Explain the triggering methods of bistable multivibrator. (10)

15. a) Explain in detail about voltage and current time base circuits. (16)

(OR)

b) Explain in detail about astable and monostable blocking oscillators. (16)
