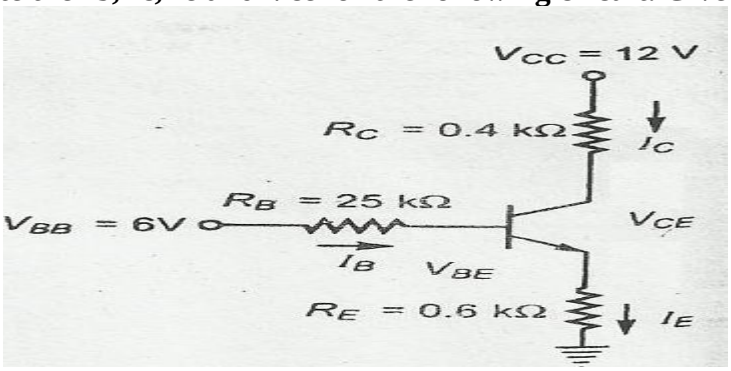
SUBJECT NAME : EC
SUBJECT CODE : EEC-401

Assignment 1

1) What are amplification factors in BJT and establish the relationship among them.
2) Draw the pin diagram of operational amplifier and what is the difference between inverting and non inverting terminal of Op-amp w.r.t to output.
3) Explain the circuit of Difference amplifier and obtain its gain.
4) Draw the circuit diagram of differentiator and obtain gain in frequency domain.
5) Explain the working of transistor as switch.
6) Draw and explain the output characteristic curve of CB configuration.
7) Draw circuit of adder substractor and obtain its gain.
8) Calculate the Vo of circuit noninverting summer.
9) Explain the concept of virtual ground and ground in any circuit.

10) Explain the effect of large signals on Op amps w.r.t slew rate.
11) Calculate the Ib, Ic, Ie and Vce for the following circuit. Given β=75



Assignment 2

1) Explain the working of transistor as amplifier.
2) Draw the circuit of instrumentation amplifier and calculate its gain.
3) Explain the effect of finite open gain on bandwidth and circuit performance (inverting amplifier).
4) Explain the effect of large signal on Op amp w.r.t output saturation voltage and output current limit.
5) What is biasing? Explain the CC transistor amplifier working.

6) What are the disadvantages of open loop configuration and draw the circuit of inverting amplifier?

Assignment 3

1. Discuss the effect of negative feedback on: (i) Gain (ii) Noise (iii) Bandwidth (iv) Input impedance and (v) Output impedance. 5(1.5.1)
2. Discuss the relative advantages and disadvantages of positive over negative feedback 2(1.5.1)
3. Obtain the relation between Gain with feedback and without feedback. 5(1.5.2)
4. What is feedback? 2(1.5.1)
5. What are feedback amplifiers? 2(1.5.1)
6. What are the types of feedback? 5(1.5.1)
7. What is positive feedback? 2(1.5.1)
8. What is negative feedback? 2(1.5.1)
9. Which feedback decreases the gain of the amplifier? 5(1.5.2)
10. Which feedback increases the gain of the amplifier? 5(1.5.2)
11. What is the advantage of negative feedback? 5(1.5.2)
12. What is the disadvantage of negative feedback? 5(1.5.2)
13. Draw the various feedback topologies. 5(1.5.3)
14. Explain voltage series and shunt feedback amplifier with an example. 5(1.5.4) 5(1.5.5)

Assignment 4

1. What is oscillator circuit?
2. What are the conditions for sustained oscillator or what is Barkhausen criterion?
3. What are the classifications of Oscillators?
4. State the frequency for RC phase shift oscillator.
5. Draw the equivalent circuit of crystal oscillator.

6. Explain the current series and shunt feedback amplifier with an example.

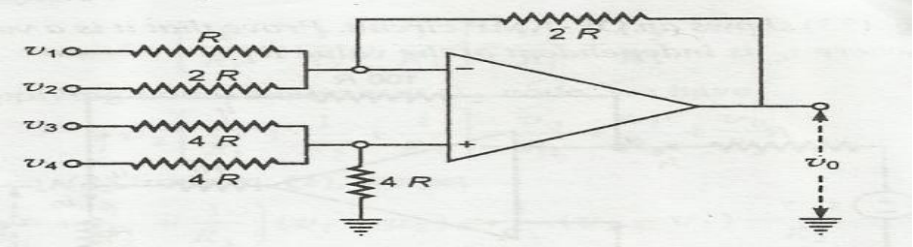
7. Explain the principle of operation and derive the expression for wein bridge oscillator.

Assignment 5

1. What is Piezo electric effect?
2. Why quartz crystal is commonly used in crystal oscillator?
3. Why is an RC phase shift oscillator called so?
4. Name three high frequency oscillators.
5. Distinguish between LC and RC oscillator.
6. Name two low frequency oscillators.
7. What are the advantages of crystal oscillator?
8. Define Barkhausen criterion.

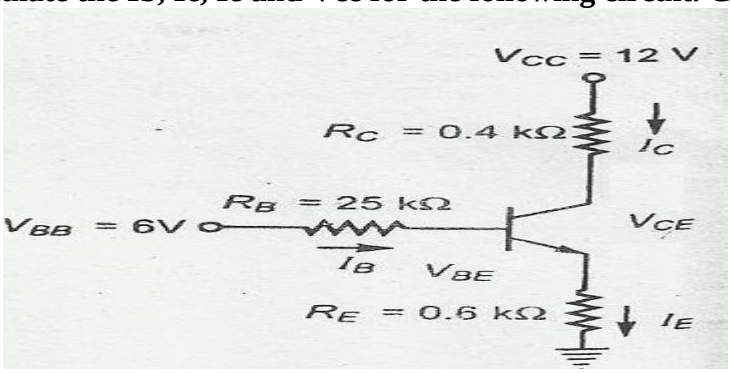
Question Bank Unit -1, 2, 5

1. **Explain the concept of virtual ground with the help of derivation.**
2. **Draw the block diagram of operational amplifier and what is the difference between inverting and non inverting terminal of Op-amp w.r.t to output.**
3. **What is Early Effect and draw the appropriate circuit diagram.**
4. **Draw the circuit diagram of differentiator and obtain gain in frequency domain.**
5. **Explain the working of transistor as switch.**
6. **Establish the relationship α and β.**
7. **Draw and explain the output characteristic curve of CE configuration& CC configuration.**
8. **Draw circuit of inverting summer and obtain its gain.**
9. **Calculate the Vo of following circuit.**



10. **Explain the circuit of Difference amplifier and obtain its gain.**

11. **Explain the effect of large signals on Op amps w.r.t slew rate.**
12. **Calculate the Ib, Ic, Ie and Vce for the following circuit. Given β=75**



13. **Explain the working of transistor as amplifier.**
14. **Explain the gain for op-amp when it is working as Lossy integrator.**
15. **Explain the gain for op-amp when it is working as practical Differentiator.**
16. **Explain the gain for op-amp when it is working as Subtractor.**
17. **Draw the circuit of instrumentation amplifier and calculate its gain.**
18. **Explain the effect of finite open gain on bandwidth and circuit performance (inverting amplifier).**
19. **Explain the effect of large signal on Op amp w.r.t saturation voltage and output current limit.**
20. **What is biasing? Why we need stabilization of operating point.**
21. **What are the disadvantages of open loop configuration and draw the circuit of inverting amplifier?**
22. **Explain an op amp as summer.**
23. **Explain op-amp as filter.**
24. **Explain op-amp as integrator.**
25. **Explain the gain for op-amp when it is working as integrator.**
26. **What is a Barkhausen criterion? Explain the working of Hartley oscillator derivethe condition of oscillation.**
27. **Explain the working of Wien bridge oscillator with derivation of condition of oscillation and frequency of oscillations.**
28. **Differentiate between positive and negative feedback.**
29. **Draw and explain working of Colpitt oscillator.**

30. **Explain the working of R C phase shift oscillator with derivation of condition of oscillation and frequency of oscillations.**
31. **Differentiate between BJT and MOSFET.**
32. **What are the two conditions for a circuit to behave as oscillator?**
33. **Define Tranconductance and current amplifier.**
34. **What is Early effect in case of BJT?**
35. **What is Desensitivity factor?**
36. **Explain BJT as switch.**
37. **Calculate R_{in} and R_{out} for series-series amplifier.**
38. **Name the different biasing methods of BJT. Describe in detail the biasing using a constant current source. Implement this biasing for the application of current mirror.**
39. **Draw the circuit diagram of Emitter follower amplifier. Replacing the transistor with its π model deduce the expression for its voltage gain.**
40. **Explain the effect if negative feedback on (i) gain (ii) distortion (iii) Bandwidth.**
41. **Explain the working of CE amplifier. Draw its small signal equivalent circuit neglecting ro and deduce the expression for overall voltage gain.**
42. **Explain the working of CC amplifier. Draw its small signal equivalent circuit neglecting ro and deduce the expression for overall voltage gain.**
43. **Explain the working of CB amplifier. Draw its small signal equivalent circuit neglecting ro and deduce the expression for overall voltage gain.**
44. **Explain frequency response of CE amplifier with suitable derivation and characteristics curve.**