

- (b) (i) Draw the block diagrams of the four possible feedback topologies and explain. (8)
- (ii) Prove that the bandwidth of the amplifier increases with negative feedback. (8)
12. (a) (i) What type of feedback is applied for oscillators? (2)
- (ii) Draw the circuit diagram of Wein bridge oscillator. Explain the need for providing both positive and negative feedback. (7)
- (iii) Draw the circuit of RC phase shift oscillator. With $R = 6\text{ k}\Omega$, $C = 1500\text{ PF}$ and $R_c = 18\text{ k}\Omega$, obtain its operating frequency. (7)

Or

- (b) Draw the circuit of a Colpitts Oscillator. Derive expressions for frequency of oscillation and condition for oscillation. (16)
13. (a) Draw the circuit of a Single tuned amplifier. Draw its frequency response. Using small signal equivalent circuit derive expressions for gain at resonance and 3 dB bandwidth. (16)

Or

- (b) Write short notes on :
- (i) Hazeltine Neutralisation. (8)
- (ii) Class C Tuned amplifier. (8)
14. (a) Draw and explain the circuit of astable multivibrator and hence draw the waveforms at salient points. Derive expressions for frequency of oscillation. (16)

Or

- (b) (i) Draw and explain the circuit of a Monostable multivibrator with suitable triggering arrangements. Give the waveforms at different modes. (10)
- (ii) Derive an expression for the pulse width of a Monostable multivibrator. (4)
- (iii) State any two applications of Monostable multivibrator. (2)

15. (a) Explain with circuit diagram and waveforms the Transistor voltage time base generator that uses Bootstrapping. (16)

Or

- (b) Explain with suitable diagrams and waveforms the working of a UJT relaxation oscillator. Also derive its frequency of oscillation. (16)
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