23EC405 - ELECTRONIC CIRCUIT ANALYSIS

QUESTION BANK

UNIT - I: Large Signal Amplifiers

5-Mark Questions

1. Explain the working of a Class A Series-fed Power Amplifier.
2. Derive the formula for conversion efficiency of a Transformer-Coupled Class A amplifier.
3. Compare the Push-Pull and Complimentary Symmetry Class B Power Amplifiers.
4. Discuss the crossover distortion in Class B amplifiers and methods to reduce it.
5. Explain the working principle of a Class AB Power Amplifier.
6. Describe the operation of a Class C amplifier with suitable diagrams.
7. Highlight the differences between Class A, Class B, and Class AB amplifiers.
8. Discuss the principle of operation and applications of Class D amplifiers.
9. Write short notes on the importance of heat sinks in power amplifiers.
10. Compare the efficiencies of Class A, B, AB, and D amplifiers.

Objective Questions

1. What is the theoretical maximum efficiency of a Class A amplifier?
   a) 25%
   b) 50%
   c) 78.5%
   d) 100%
   Answer: b) 50%
2. Which amplifier type operates for more than 180° of the input cycle?
   a) Class A
   b) Class B
   c) Class AB
   d) Class C
   Answer: a) Class A
3. Class B amplifiers are typically used to overcome:
   a) High power loss
   b) Crossover distortion
   c) Low efficiency
   d) Large signal distortion
   Answer: b) Crossover distortion
4. Which amplifier type is known for its high efficiency?
   a) Class A
   b) Class AB
   c) Class D

d) Class C
Answer: c) Class D

5. The complimentary symmetry configuration is commonly used in:
   a) Class A amplifiers
   b) Class B amplifiers
   c) Class AB amplifiers
   d) Class D amplifiers
   Answer: b) Class B amplifiers
6. Which amplifier operates only for less than 180° of the input signal?
   a) Class A
   b) Class B
   c) Class AB
   d) Class C
   Answer: d) Class C
7. Heat sinks are used in power amplifiers to:
   a) Increase input impedance
   b) Reduce thermal resistance
   c) Decrease gain
   d) Improve bandwidth
   Answer: b) Reduce thermal resistance
8. The efficiency of a transformer-coupled Class A amplifier is:
   a) 25%
   b) 50%
   c) 78.5%
   d) 100%
   Answer: c) 78.5%
9. Class AB amplifiers reduce:
   a) Power efficiency
   b) Harmonic distortion
   c) Crossover distortion
   d) Input signal amplitude
   Answer: c) Crossover distortion
10. In Class D amplifiers, the transistors function as:
    a) Linear devices
    b) Switches
    c) Current amplifiers
    d) Voltage amplifiers
    Answer: b) Switches

UNIT - II: Tuned Amplifiers

5-Mark Questions

1. Explain the working of a Single Tuned Amplifier and its applications.

2. Define Q-factor and derive its expression for a tuned amplifier.
3. Describe the frequency response of a Single Tuned Amplifier.
4. Discuss the working principle of a Double Tuned Amplifier.
5. Compare the performance of Single Tuned and Double Tuned Amplifiers.
6. Explain the concept of stagger tuning and its significance.
7. What is synchronous tuning? Discuss its advantages.
8. Write short notes on bandwidth considerations in tuned amplifiers.
9. How does the coupling coefficient affect the frequency response in double-tuned circuits?
10. Discuss the limitations of tuned amplifiers in high-frequency applications.

Objective Questions

1. The Q-factor of a tuned circuit is defined as:
   a) Energy stored / Energy dissipated
   b) Energy dissipated / Energy stored
   c) Bandwidth / Resonant frequency
   d) Resonant frequency / Bandwidth
   Answer: d) Resonant frequency / Bandwidth
2. The bandwidth of a Single Tuned Amplifier depends on:
   a) Gain
   b) Q-factor
   c) Coupling
   d) Input impedance
   Answer: b) Q-factor
3. Double Tuned Amplifiers are used to achieve:
   a) Low gain
   b) High bandwidth
   c) Improved stability
   d) Narrow bandwidth
   Answer: b) High bandwidth
4. Stagger tuning is used to:
   a) Increase selectivity
   b) Broaden the bandwidth
   c) Reduce distortion
   d) Improve gain
   Answer: b) Broaden the bandwidth
5. The resonant frequency of an LC circuit is given by:
   a)
   b)
   c)
   d)
   Answer: c)
6. The coupling coefficient in a double-tuned amplifier determines:
   a) Gain
   b) Bandwidth
   c) Input impedance

d) Selectivity
Answer: b) Bandwidth

7. Which of the following has the highest Q-factor?
   a) Air core inductor
   b) Iron core inductor
   c) Ferrite core inductor
   d) Copper wire inductor
   Answer: a) Air core inductor
8. The term synchronous tuning refers to:
   a) Aligning resonant frequencies
   b) Widening bandwidth
   c) Minimizing gain
   d) Maximizing distortion
   Answer: a) Aligning resonant frequencies
9. In tuned amplifiers, stagger tuning is applied to:
   a) Reduce noise
   b) Improve selectivity
   c) Broaden frequency response
   d) Increase efficiency
   Answer: c) Broaden frequency response
10. The primary application of tuned amplifiers is in:
    a) Audio amplifiers
    b) RF communication
    c) Power systems
    d) Digital circuits
    Answer: b) RF communication