

1. Which type of filter is designed to allow low frequencies to pass while attenuating high frequencies?

- a) Low pass filter
- b) High pass filter
- c) Band pass filter
- d) Band elimination filter

Answer: a) Low pass filter

Explanation: A low pass filter is designed to pass signals with frequencies lower than a certain cutoff frequency while attenuating frequencies higher than the cutoff frequency.

2. What is the defining characteristic of a high pass filter?

- a) It allows high frequencies to pass
- b) It attenuates low frequencies
- c) It passes a range of frequencies
- d) It eliminates a range of frequencies

Answer: b) It attenuates low frequencies

Explanation: A high pass filter is designed to allow high frequencies to pass while attenuating or blocking low frequencies.

3. Which filter type is effective for isolating a specific band of frequencies from a signal?

- a) Low pass filter
- b) High pass filter
- c) Band pass filter

d) Band elimination filter

Answer: c) Band pass filter

Explanation: A band pass filter allows a specific range or band of frequencies to pass while attenuating frequencies outside that range.

4. In m-derived filters, what parameter controls the selectivity of the filter?

- a) m-factor
- b) Resistor value
- c) Capacitor value
- d) Inductor value

Answer: a) m-factor

Explanation: The m-factor in m-derived filters controls the selectivity or sharpness of the filter's frequency response curve.

5. Which type of filter is formed by combining multiple individual filters to achieve desired characteristics?

- a) Composite filter
- b) Passive filter
- c) Active filter
- d) Resonant filter

Answer: a) Composite filter

Explanation: A composite filter is formed by combining multiple individual filters, such as low pass, high pass, and band pass filters, to achieve specific filtering characteristics.

6. What is a common objective of Butterworth, Chebyshev, and elliptic function approximations?

- a) Maximizing passband ripple
- b) Minimizing stopband attenuation
- c) Achieving flat passband response
- d) Creating non-linear frequency response

Answer: c) Achieving flat passband response

Explanation: Butterworth, Chebyshev, and elliptic function approximations are all aimed at achieving a flat passband response with different trade-offs in terms of ripple and stopband attenuation.

7. Which approximation method prioritizes minimizing the maximum passband ripple?

- a) Butterworth approximation
- b) Chebyshev approximation
- c) Elliptic function approximation
- d) Bessel approximation

Answer: a) Butterworth approximation

Explanation: Butterworth approximation prioritizes achieving a flat passband response with no ripple, thus minimizing the maximum passband ripple.

8. What is a characteristic of Chebyshev approximation compared to Butterworth approximation?

- a) Chebyshev approximation has a flatter passband response

- b) Chebyshev approximation has steeper rolloff
- c) Chebyshev approximation has higher stopband attenuation
- d) Chebyshev approximation has lower order

Answer: b) Chebyshev approximation has steeper rolloff

Explanation: Chebyshev approximation achieves steeper rolloff compared to Butterworth approximation by allowing some ripple in the passband.

9. Which filter approximation method offers the most flexibility in shaping the frequency response?

- a) Butterworth approximation
- b) Chebyshev approximation
- c) Elliptic function approximation
- d) Bessel approximation

Answer: c) Elliptic function approximation

Explanation: Elliptic function approximation offers the most flexibility in shaping the frequency response with the trade-off of increased complexity.

10. What technique involves transforming a filter's frequency response from one type to another to meet specific requirements?

- a) Frequency modulation
- b) Impulse response transformation
- c) Frequency transformation
- d) Phase shifting

Answer: c) Frequency transformation

Explanation: Frequency transformation involves converting a filter's frequency response from one type to another, such as from low pass to high pass or band pass, to meet desired specifications.