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Continuing Education Course #084
Filters and Equalizers

1. Exponential s-operator notation permits root descriptions in both frequency and time domains:
- a. True,
- b. False.

2. Analog systems can be represented in the frequency domain using:
- a. magnitude and phase plots,
- b. polynomial equations,
- c. either of the above,
- d. none of the above.

3. Some system time domain behaviors can be deduced from the frequency domain response using:
- a. magnitude response,
- b. phase response,
- c. group delay response,
- d. none of the above.

4. A single pole behavior produces a phase shift at the pole frequency of:
- a. (0) degrees,
- b. (-45) degrees,
- c. (-90) degrees,
- d. (-180) degrees.

5. A single pole behavior produces an asymptotic gain decrease above the pole frequency of:
- a. zero,
- b. 10x decrease per decade of frequency increase,
- c. 100x decrease per decade of frequency increase,
- d. none of the above.

6. A complex conjugate double pole behavior produces a phase shift at the pole frequency of:
- a. (0) degrees,
- b. (-45) degrees,
- c. (-90) degrees,
- d. (-180) degrees.

7. A complex conjugate double pole behavior produces an asymptotic gain decrease below the pole frequency of:
- a. zero,
- b. 10x decrease per decade of frequency increase,
- c. 100x decrease per decade of frequency increase,
- d. none of the above.

8. A complex conjugate double pole behavior produces an asymptotic gain decrease above the pole frequency of:
- ○ a. zero,
- ○ b. 10x decrease per decade of frequency increase,
- ○ c. 100x decrease per decade of frequency increase,
- ○ d. none of the above.

9. A complex conjugate double pole behavior produces a group delay at the characteristic frequency that is proportional to its Q factor:
- ○ a. True,
- ○ b. False.

10. A Butterworth low pass filter has all poles and no zeroes in its transfer function
- ○ a. True,
- ○ b. False.

11. A Butterworth low pass filter has a maximally flat magnitude behavior
- ○ a. True,
- ○ b. False.

12. A Butterworth low pass filter has a maximally flat group delay behavior
- ○ a. True,
- ○ b. False.

13. A Butterworth low pass filter has little or no over-shoot in the step response
- ○ a. True,
- ○ b. False.

14. A Chebyshev low pass filter has all poles and no zeroes in its transfer function
- ○ a. True,
- ○ b. False.

15. A Chebyshev low pass filter has a maximally flat magnitude behavior
- ○ a. True,
- ○ b. False.

16. A Chebyshev low pass filter has little or no over-shoot in the step response
- ○ a. True,
- ○ b. False.

17. A Cauer low pass filter has all poles and no zeroes in its transfer function
- ○ a. True,
- ○ b. False.

18. A Cauer low pass filter has a maximally flat magnitude behavior
- ○ a. True,
- ○ b. False.

19. A Cauer low pass filter has little or no over-shoot in the step response
- ○ a. True,
- ○ b. False.

20. A Bessel low pass filter has all poles and no zeroes in its transfer function

- a. True,
- b. False.

21. A Bessel low pass filter has a flat group delay behavior
- a. True,
- b. False.

22. A Bessel low pass filter has little or no over-shoot in the step response
- a. True,
- b. False.

23. A delay equalizer is composed of all pass filter components:
- a. True,
- b. False.

24. A delay equalizer is employed to control group delay behaviors:
- a. True,
- b. False.

25. A transform is available to convert a lop pass prototype to a design for:
- a. high-pass applications,
- b. band-pass applications,
- c. both applications above,
- d. none of the above.