BSNL TTA Question Paper: Network Filters and Transmission Lines

Exam Name: TTA (Telecom Technical Assistant)
Specialization: Section C - Network Filters and Transmission Lines
Conducted By: BSNL (Bharat Sanchar Nigam Limited)
Conducted In: December 2007
Number of Questions: 50
Maximum Marks: 250
Time Allowed: 90 Minutes
Negative Marking: Yes
Type of Questions: Objective Type (Multiple Choice)

Section (Network Filters and Transmission Lines)

1. Pick up wrong statement

(a) A group of interconnected individual components known as circuit elements is called a network.

(b) A humped network is an arrangement of physically separate resistors, inductors and capacitors.

(c) Distributed network is one, which the resistive, inductive and capacitive effects are inseparable for network analyses.

(d) A branch is a network having four elements.

2. Kirchoff's laws for networks are:

(a) The algebraic sum of branch currents meeting at any node is zero.

(b) The algebric sum of voltage drops in any set of branches forming a closed circuit or loop must be equal to zero.

(c) Both (a) and (b)

(d) Neither (a) and (b)

3. Mutually coupled circuit is a circuit which is:

(a) Bilateral

(b) Unilateral

(c) None of these

(d) Either (a) or (b)

4. Duality is a

(a) Transformation in which current and voltages are interchanged

(b) Active sources become passive sources

(c) Passive sources become active sources

(d) Both (b) and (c)

5. Combined inductance of two inductors L1 and L2 connected and voltages are interchanged

(a) L1 + L2

(b) (L1 + L2)/ L1

(c) (L1 + L2) / (L1 X L2)

(d) (L1 X L2) / (L1 + L2)

6. Normal analysis techniques are based on

(a) Thevenin's theorem

(b) Tellegan's theorem

(c) Superposition theorem

(d) Kirchoff's Law

7. Two voltage sources can be connected in parallel when they are equal in

(a) Magnitude

(b) Frequency

(c) Phase

(d) All the above

8. The kirchoff's law fail in

(a) Linear circuits

(b) Non-linear circuits

(c) Lumped parameter circuits

(d) Distributed parameter circuits

9. Which of the following is a nonreciprocal network ?

(a) A network consisting of all resistances

(b) A network consisting of all capacitances

(c) A network consisting of all inductances

(d) A transistor model

10. When two systems obey equations of the same form the systems are said to be

(a) Similar system

(b) Identical system

(c) Analogous system

(d) Digital system

11. For a highly selective circuit

(a) It must have large value of Q

(b) It must have high value of capacitance to produce resonance at fixed frequency

(c) Either (a) or (b)

(d) Neither (a) nor (b)

12. A network consisting of four terminals is called a

(a) One port network

(b) Two port network

(c) Four port network

(d) None of the above

13. Driving point of a network is

(a) A port where voltage or current source is connected

(b) A terminal where load is connected

(c) A port where load is connected

(d) None of the above

14. Ceramic filters are similar in construction to

(a) Crystal filters

(b) Crystal ladder filters

(c) Crystal lattice

(d) Mechanical filters

15. When two port networks are connected in parallel the resultant

(a) Z parameters are the some of individual parameters

(b) Y- parameters are the some of individual parameters

(c) Both (a) and (b)

(d) Neither (a) nor (b)

16. Electric wave filters

(a) Allow electric signals with specified frequency range

(b) Suppress signals outside a specified range

(c) Both (a) and (b) occurs simultaneously

(d) Either (a) or (b) occur at a time

17. A cascade connection of low pass filter and high pass filter is called

(a) Band pass filter

(b) Band elimination filter

(c) Neither (a) nor (b)

(d) Both (a) and (b)

18. The response of a network is decided by the location of

(a) Its poles

(b) Its zeros

(c) Either (a) nor (b)

(d) Both (a) and (b)

19. Example of two port network is

(a) Transformer

(b) Transmission line

(c) Bridge circuit and transistor circuit

(d) All of the above

20. The circuit whose properties are same in either direction is called

(a) Universal circuit

(b) Reversible circuit

(c) Unilateral circuit

(d) Bilateral circuit

21. Distortion in transmission line is due to

(a) Delay distortion

(b) Phase distortion

(c) Frequency distortion

(d) All the above

22. The general parameters distributed along a transmission line are

(a) R&L only

(b) L&C only

(c) C&G only

(d) R, L, C&G

23. Phase distortion is prominently caused by

(a) circuit transients

(b) non linear characteristics

(c) linearity

(d) none

24. The voltage or current from the receiving end towards the sending end, decreasing in amplitude with increasing distance from the load is called

(a) incident wave

(b) medium wave

(c) reflected wave

(d) none of above

25. E.M. Waves of UHF is propagated efficiently via

(a) parallel wire transmission lines

(b) open wire transmission lines

(c) wave guides

(d) coaxial cables

26. Norton theorem is valid for network containing only

(a) linear elements

(b) no linear elements

(c) resistance

(d) reactance

27. The maximum power is absorbed by one network from other, joined to it at two terminals when the impedance of one is

(a) complex conjugate of other

(b) square root of other

(c) same as other

(d) none of above

28. The decrease in effective conductor cross section at high frequencies

(a) decrease the conductor resistance

(b) increase the conductor resistance

(c) no change in conductor resistance

(d) none of above

29. Voltage standing wave ratio lies in the range

(a) 0 to 1

(b) 1 to infinity

(c) 0 to infinity

(d) -1 to +1

30. Attenuators have applications

(a) in AC circuits only

(b) in DC circuits only

(c) in AC as well DC circuits

(d) in low frequency circuits only

31. In an network

(a) the number of tree branches is equal to the number of links

(b) the number of tree branches cannot be equal to the number of links

(c) the number of tree branches has no relation with the number of links branches

(d) none of these

32. In open line transmission systems, attenuation is more at

(a) lower frequencies

(b) medium frequencies

(c) higher frequencies

(d) remains constant

33. a power ratio 100 is equivalent to

(a) 10 dB

(b) 20 dB

(c) 50 dB

(d) 100 dB

34. The velocity factor for small widely spaced conductors such as open wire line in air is very nearly

(a) 0.66

(b) 0.98

(c) 0.82

(d) 0.76

35. Transmission of power to a load over a transmission line achieves optimum value when standing wave ratio (SWR) becomes

(a) 2 : 1

(b) 1 : 2

(c) 1 : 1

(d) 1 : 10

36. The VSWR in a short circuited loss less transmission line equals

(a) infinity

(b) unity

(c) zero

(d) none of above

37. The velocity factor of a transmission line

(a) is always greater than unity

(b) depend upon the permittivity of the surrounding medium

(c) is lease for air medium

(d) is governed by skin effect

38. Which of the following is not correct

(a) voltage source is an active element

(b) current source is a passive element

(c) resistance is a passive element

(d) conductance is a passive element

39. A network is said to be nonlinear if it does not satisfy

(a) superposition condition

(b) homogeneity condition

(c) both superposition and homogeneity conditions

(d) associative condition

40. An capacitor with zero initial condition at t = 0+ act as a

(a) short circuit

(b) open circuit

(c) current source

(d) voltage source

41. An inductor stores energy in

(a) electrostatic field

(b) electromagnetic field

(c) magnetic field

(d) core

42. In series LCR circuits, at resonance,

(a) current is maximum, power factor is zero

(b) current is maximum, power factor is unity

(c) current is minimum, power factor is unity

(d) none of above

43. In an RCL series circuit, during resonance, the impedance will be

(a) zero

(b) minimum

(c) maximum

(d) none of above

44. When a source is delivering maximum power to load, the efficiency of the circuit is always

(a) 50%

(b) 75%

(c) 100%

(d) None of above

45. In a linear network, when the ac input is doubled, the ac output becomes

(a) two times

(b) four times

(c) half

(d) one forth

46. A passive network has

(a) current sources but no voltage sources

(b) voltage sources but no current sources

(c) both current and voltage sources

(d) no voltage or current sources

47. Two resistances are connected in parallel and each dissipates 50 waits. The total power supplied by the source is

(a) 25 watts

(b) 50 watts

(c) 100 watts

(d) 200 watts

48. Three bulbs of 60 watts each are connected is parallel across 220v, 50 Hz supply. If one bulb burns out

(a) only remaining two will operate

(b) remaining two will not operate

(c) all of three will operate

(d) there will be heavy current from the supply

49. The amplitude of an audio signal is 10 and that of carrier wave is 50. Percentage modulation is:

(a) 0.2

(b) 20

(c) 5

(d) 60

50. The main advantage of PCM system is:

(a) lower bandwidth

(b) lower power

(c) lower noise