BEL Placement Paper 6

Technical-Electronics

1. The noise figure of a receiver is a measure of:
1. Excess noise generated
2. Bandwidth of the receiver
3. Gain of the receiver
4. Operating frequency

2. The ratio receiver is:
1. Direct detection type
2. Super regenerative type
3. Super heterodyne type
4. None of these

3. In an amplitude modulation system, the modulation index is dependent upon:
1. Modulating frequency only
2. Carrier amplitude only
3. Modulating signal amplitude only
4. Modulating and carrier amplitudes only

4. Image rejection mixer is generally used:
1. To reject the unwanted signal
2. To improve signal amplitude
3. To improve noise figure
4. To improve conversion loss

5. The value of a resistor creating thermal noise is doubled. The noise power generated is therefore:
1. Halved
2. Quadrapuled
3. Doubled
4. Unchanged

6. Indicated the false statement:
1. HF mixer are generally noisier than HF amplifier
2. Impulse noise voltage is independent of bandwidth
3. Thermal noise is independent of the frequency at which it is measured
4. Industrial noise is usually of the impulse type

7. If the carrier of a 100 percent modulated AM wave is suppressed the percentage power saving will be:
1. 50 b. 70 c. 100 d. 66.6

8. A balanced modulator produces:
1. The carrier and Two side bands
2. The carrier and one side band
3. Two side bands alone

4. Carrier and a number of side bands

9. The frequency deviation in FM system is proportional to:
1. Modulating frequency
2. Carrier amplitude
3. Modulating signal amplitude
4. None of these

10. In FM, the total transmitted power is:
1. Dependent on modulating signal amplitude
2. Dependent on modulating frequency
3. Dependent on modulating index
4. Independent of the above

11. The carrier in an FM system disappears for the lowest modulation index of:
1. 0.5 b. 1.0 c. 2.4 d. 3.5

12. The difference between phase and frequency modulation:
1. Is purely theoretical because they are the same in practice
2. Is too great to make the two systems compatible
3. Lies in the poorer audio response of phase modulation
4. Lies in the different definition of the modulation index

13. The overall noise figure of two cascaded amplifiers is equal to
1. The algebraic sum of the two
2. The sum of the squares of the two
3. The square root of the product of the two
4. None of these

14. The noise power output of an amplifier is equal to:
1. KTo BFG
2. KTo FG
3. KTo F/G
4. KTo / FG

15. The effective noise temperature of an amplifier is equal to
1. (F + 1) To
2. FTo
3. (F − 1) To
4. None of these

16. The noise figure of an amplifier depends upon
1. Its bandwidth
2. Its gain
3. Its operating frequency
4. None of these

17. The velocity of electromagnetic wave in a coaxial cable is

1. Equal to the velocity in free space
2. Less than the velocity in free space
3. Greater than the velocity in free space
4. None of these

18. The standing wave ratio [SWR] in a transmission line:
1. Is proportional to the load impedance
2. Is dependent on the source impedance
3. Is a mis-match between the load and line
4. Is a measure of its power handling capability

19. The standing wave ratio (SWR) is unity in a transmission line if
1. The load impedance is equal to the characteristic impedance of the line
2. The load impedance is twice that of the characteristic impedance
3. The load impedance is half of the characteristic impedance of the line
4. None of these

20. The standing wave voltage node along a line repeats at the rate of if L is the wave length
1. L/4 b.L/2 c.L d.2L

21. A quarter wave line when short circuited at the far end behaves like
1. Pure inductor
2. Pure capacitor
3. Parallel tuned circuit
4. Series tuned circuit

22. The stub line used to match transmission line with a given load impedance is generally
1. Another open circuited line
2. Another short circuited line
3. Quarter wave transmission line
4. Half wave transmission line

23. The smith chart generally covers a distance of
1. Quarter wavelength
2. Half wavelength
3. One wavelength
4. Twice the wavelength

24. The component generally used to sample a portion of the energy transmitted in a line is
1. Isolator
2. Circulator
3. Directional coupler
4. None of these

25. The return loss in a transmission line is a measure of
1. Loss of the line
2. Standing wave ratio
3. Characteristic impedance of the line

4. None of these

26. The antenna can be considered as
1. Matching the source and free space
2. Matching the source to the line
3. Matching the line and free space
4. None of these

27. The free space impedance is approximately equal to
1. 177 W
2. 277 W
3. 377 W
4. 50 W

28. The polarization refers to
1. The physical orientation of the radiated wave
2. The directional of propagation of the wave
3. Direction perpendicular to the propagation of the wave
4. None of these

29. If u & e are the permeability and permittivity respectively the characteristic impedance of the medium is given by
1. ue b. Öu/e c. Öe/u d. Öeu

30. The power density at distance 'r' from an isotropic radiator with transmitted power P is:
1. P/r2
2. P/2 p r2
3. P/4 p r2
4. None of these

31. Frequencies in the UHF range is normally propagated by means of
1. Ground waves
2. Sky waves
3. Surface waves
4. Space waves

32. As electromagnetic waves travel in free space, only one of the following can happen to them
1. Absorption
2. Attenuation
3. Reflection
4. Refraction

33. High frequency waves are
1. Absorbed by the F2 layer
2. Reflected by the D layer
3. Affected by the solar cycle
4. Capable of use for long distance communications on the moon

34. Indicate which one of following terms applies to troposcatter propagation
1. SIDS
2. Fading
3. Fraday rotation
4. Atmospheric storms

35. When microwave signals follow the curvature of the earth, this in known as
1. Faraday effect
2. Ducting
3. Ionospheric reflection
4. Tropospheric scattering

36. An ungrounded antenna near the ground:
1. Is unlikely to need an earth mat
2. Acts as a single antenna of twice the height
3. Must be horizontally polarized
4. Acts as an antenna array

37. One of the following consists of non-resonant antenna:
1. The folded dipole
2. The rhombic antenna
3. The end fire array
4. The broad side array

38. Balun is:
1. A circuit element to connect balance line to unbalanced antenna or line:
2. A circuit element to connect balance line to balanced line
3. A circuit element to connect unbalance line to unbalanced line
4. None of these

39. The slotted line is used to measure:
1. Standing wave ratio
2. Load impedance
3. Source impedance
4. None of these

40. In amplitude modulation Ec (1 + m Sin Wmt) Sin Wot, each side band amplitude will be:
1. Ecm/2
2. Ecm
3. Ec/m
4. 2Ec/m

41. FM modulation becomes equivalent to AM modulation if
1. FM index is greater than 1
2. FM index is equal to 1
3. FM index is very much less than 1
4. FM index less than or equal to 1

42. S/N improvement of FM over AM, B is the FM modulation index
1. 3B2 b.B c.2B d.B/2

43. Picture transmission in TV employs
1. Suppressed carrier modulation
2. Vestigial side band
3. Single side band
4. None of these

44. Sound transmission in TV employ
1. Amplitude modulation
2. Phase modulation
3. Frequency modulation
4. Pulse amplitude modulation

45. One of the following is an indirect way of generating FM this is the:
1. Reactance FET modulator
2. Varacter divide modulator
3. Amstrong modulator
4. Reactance bipole transistor modulator

46. The modulation index of AM wave is changed from 0 to 1. The transmitted power is
1. Un-changed
2. Halved
3. Doubled
4. Increased by 50%

47. The isotropic antenna is represented by
1. Dipole antenna
2. Rhombic antenna
3. Yagi uda antenna
4. No such antenna exists in practice

48. The gain of parabolic reflector antenna is proportional to
1. The diameter of the reflector
2. Square of the diameter of the reflector
3. Aperture area of the feed
4. None of these

49. The parabolic reflector antenna are generally used to
1. Provide high gain
2. Provide pencil beam
3. Increase bandwidth of operation
4. None of these

50. Cassegrain feed is used with a parabolic reflector to
1. Increase gain of the system
2. Increase the bandwidth of the system

3. Reduce the size of the main reflector
4. Allow the feed to be placed at a convenient point

51. A helical antenna is used for satellite tracking because of its
1. Circular polarization
2. Maneuverability
3. Broad bandwidth
4. Good front – to – back ratio

52. The discone antenna is
1. A useful direction finding antenna
2. Used as a radar receiving antenna
3. Circularly polarized like other circular antenna
4. Useful as a VHF receiving antenna

53. Waveguides are used mainly for microwave signals because
1. They depend on straight line propagation which applies to microwaves only
2. Losses would be too heavy at lower frequencies
3. There are no generators powerful enough to excite them at lower frequencies
4. They would be too bulky at lower frequencies

54. The wavelength in a waveguide
1. Is greater than in free space
2. Depends only on the waveguide dimensions and the free-space wavelength
3. Less than the free space wavelength
4. Equal to the free space wavelength

55. The dominant mode of propagation is preferres with rectangular waveguide because(indicate false statement)
1. It leads to the smallest waveguide dimensions
2. The resulting impedance can be matched directly to coaxial lines
3. It is easier to excite than the other modes
4. Propagation of it without any spurious generation can be ensured

56. The velocity of propagation (group velocity) in a waveguide is
1. Less than the free space velocity
2. Greater than the free space velocity
3. Equal to be free space velocity
4. None of these

57. A wave can propagate in a waveguide if its cut off wavelength is
1. Greater than the free space wavelength
2. Less than the free space wavelength
3. Equal to be free space wavelength
4. None of these

58. The dominant mode in a rectangular waveguide is
1. TE11 b. TE10 c.TE20 d.TM11

59. The characteristic wave impedance of a waveguide
1. Depends on the mode of propagation
2. Does not depend on the mode of propagation
3. Is same as the free space impedance
4. None of these

60. A choke flange may be used to couple two waveguides
1. To help in the alignment of the waveguides
2. Because it is simpler than any other joint
3. To compensate the discontinuities at the joint
4. To increase the bandwidth of the system

61. The dominant mode in a circular waveguide is
1. TE01 b.TE11 c.TM01 d.TM11

62. A ferrite is
1. A non-conductor with magnetic properties
2. An inter metallic compound with particularly good conductivity
3. An insulator which heavily attenuates magnetic fields
4. A microwave semiconductor invented by farady

63. The maximum power that may be handled by a ferrite component is limited by the
1. Curie temperature
2. Saturation magnetization
3. Line width
4. Gyro magnetic resonance

64. The isolator is
1. Bidirectional
2. Unidirectional
3. Used to tap the power in a waveguide transmission line
4. Used for None of these of the above

65. Isolator is generally used:
1. To protect the high power transmitter
2. To protect receiver
3. To protect the antenna
4. To avoid arcing in waveguides

66. A TR tube is used
1. To protect the high power transmitter
2. To protect receiver
3. To avoid arcing in waveguides
4. For None of these of the above

67. Rieke diagrams are used to select best operating conditions for
1. TWT amplifier
2. Klystron oscillator

3. Magnetron oscillator
4. Cross field amplifiers

68. The gain bandwidth product of a microwave transistor FT, is the frequency at which the
1. Alpha of the transistor falls by 3 dB
2. Beta of the transistor falls by 3 dB
3. Beta of the transistor falls to unity
4. Power gain of the transistor falls to unity

69. The cavity magnetron uses strapping to
1. Prevent mode jumping
2. Prevent cathode-back heating
3. Ensure bunching
4. Improve the phase-focussing effect

70. The transferred – electron bulk effect occurs in
1. Germanium
2. Gallium arsenide
3. Silicon
4. Metal semiconductor junction

71. One of the following is not used as a microwave mixer or detector
1. Crystal diode
2. Schottky – barrier diode
3. Backward diode
4. PIN diode

72. SAW devices may be used as:
1. transmission media like stripline
2. filters
3. UHF amplifiers
4. Oscillators at millimeter frequencies

73. Surface acoustic waves propagate in:
1. Gallium arsenide
2. Indium phosphide
3. Stripline
4. Quartz crystal

74. A parametric amplifier has an input and output frequency of 2.25 GHz, and is pumped at 4.5 GHz
is a
1. Traveling wave amplifier
2. Degenerate amplifier
3. Lower-side band up converter
4. Upper-side band up converter

75. The negative resistance in a tunnel diode
1. Is maximum at the peak point of the characteristic

2. Is available between the peak and valley points
3. Is maximum at the valley point
4. May be improved by the reverse bias

76. Microwave links repeaters are typically 50KM apart
1. Because of atmospheric attenuation
2. Because of output tube power limitations
3. Because of Earth's curvature
4. To ensure that the applied voltage is not excessive

77. Microwave links are generally preferred to coaxial for television transmission because
1. They have less overall phase distortion
2. They are cheaper
3. Of their greater bandwidths
4. Of their relative immunity to impulse noise

78. A geostationary satellite
1. Is motionless in space(except for its spin)
2. Is not really stationary at all, but orbits the earth with a 24 hour period
3. Appears stationary over Earth's magnetic pole
4. Is located at a height of 35800KM to ensure global coverage

79. The geostationary satellite launched by India are called
1. INTELSAT
2. INSAT
3. COMSAT
4. MARISAT

80. A parametric amplifier must be cooled
1. Because parametric amplification generates a lot of hest
2. To increase bandwidth
3. Because it cannot operate at room temperature
4. To improve the noise performance

81. If the peak transmitted power in a Radar system is increased by a factor of 16, the maximum range will be increased by a factor of
1. 2 b. 4 c.8 d. 16

82. Telephone traffic is measured
1. With echo
2. By relative congestion
3. In terms of the grade of service
4. In erlangs

83. If the antenna diameter in a radar system is increased by a factor of 4, the maximum range will be increased by a factor of:
1. Ö2 b. 2 c. 4 d. 8

84. A high PRF will (indicate the false statement)
1. Make the returned echoes easier to distinguish from noise
2. Make target tracking easier with conical scanning
3. Increase the maximum range
4. Have no effect on the range resolution

85. The bandwidth of a radar receiver is inversely proportional to the
1. Pulse width
2. Pulse repetition frequency
3. Pulse interval
4. Square root of the peak transmitted power

86. If d is the pulse width, T is pulse repetition period and P is the peak power, the duty ratio is
1. T/d b.P/T c.P/d d.d/T

87. If d is the duty ratio and P is the peak power in a pulsed transmitter, then the average power is
1. P.d b. P.2d c.P/d d. P/2d

88. If the return echo arrives after the allocated pulse interval
1. It will interfere with operation of the transmitter
2. The receive might be overloaded
3. It will not be received
4. The target will appear closer than it really is

89. If the target cross section is changing, the best system for accurate angle traking is
1. Lobe switching
2. Sequential lobing
3. Conical scanning
4. Monopulse

90. After a target has been acquired the best scanning system for tracking is
1. Nodding
2. Spiral
3. Conical
4. Helical

91. The Doppler frequency increases as the target
1. Approaches the radar
2. Recedes the radar
3. Moves perpendicular to the beam
4. Does not depend on the target velocity

92. The Doppler effect is used in (indicate the false statement)
1. Moving target plotting on the PPI
2. MTI system
3. FM Radar
4. CW Radar

93. Solution to the blind speed problem is to
1. Change the Doppler frequency
2. Vary the PRF
3. Use monopulse
4. Use MTI

94. The A-scope displays
1. Target position and range
2. Target range but not position
3. Target position but not range
4. Neither range nor position but only velocity

95. In the colour television system the sub carrier frequency in MHz is approximately
1. 3.58 b.4.5 c. 45.75 d. 5.58

96. In television 4: 3 : represents
1. The interlace ratio
2. The maximum horizontal deflection
3. Aspect ratio
4. The ratio of the two diagonals of picture tube

97. Equalizing pulses in TV are sent during the:
1. Horizontal blanking
2. Vertical blanking
3. The serrations
4. Horizontal retrace

98. The number of lines per field in Indian television system is:
1. 625 b. 312.5 c. 525 d. 262.5

99. The number of frames in Indian TV system is:
1. 50 b. 60 c. 25 d.30

100. In a TV receiver the colour killer:
1. Cuts off the chromastages during monochrome reception
2. Ensures that no colour is transmitted to monochrome receivers
3. Prevents colour overloading
4. Makes sure that the colour burst is not mistaken for sync pulses

Answer:-

1. a

2. c

3. b

4. c

5. b

6. b

7. d

8. c

9. c

10. d

11. c

12. d

13. d

14. a

15. c

16. d

17. b

18. c

19. a

20. b

21. c

22. b

23. b

24. c

25. b

26. c

27. c

28. c

29. b

30. c

31. d

32. b

33. c

34. b

35. b

36. d

37. b

38. a

39. a

40. a

41. c

42. a

43. b

44. c

45. c

46. d

47. d

48. b

49. b

50. d

51. a

52. d

53. d

54. a

55. b

56. a

57. c

58. b

59. a

60. b

61. c

62. a

63. a

64. b

65. a

66. b

67. c

68. a

69. d

70. b

71. d

72. b

73. d

74. b

75. b

76. c

77. a

78. b

79. b

80. d

81. d

82. a

83. c

84. c

85. a

86. d

87. a

88. d

89. d

90. c

91. a

92. a

93. b

94. b

95. a

96. c

97. b

98. b

99. a

100.a