1. In a broadside array, maximum radiation occurs

(A) At 90° to the line of array

(B) At 45° to the line of the array

(C) Along the line of the array

(D) At 60° to the line of the array

2. Using shorter pulses in a pulsed radar

(A) increases the maximum range

(B) improves the range accuracy

(C) improves the range resolution

(D) makes the target tracking easier

3. For measuring inductance with high Q, we should use

(A) Maxwell's bridge

(B) Maxwell Wien bridge

(C) Hay's bridge

(D) Either (A) or (B)

4. In a CRO, the time base signals is applied to

(A) X plates

(B) Y plates

(C) Either X or Y Plates

(D) Alternately X and Y Plates

5. If two time varying signals of equal magnitude and zero phase displacement are applied to X and Y plates respectively, of CRO, the display will be

(A) A straight line

(B) A circle

(C) An ellipse

(D) A square

6. A lead compensator

(A) speeds up the transient response

(B) increases the stability margin

(C) increases the stability margin and speeds up the transient – response

(D) speeds up steady state response

7. 'Burst refresh' in DRAM is also called

(A) Concentrated refresh

(B) Distributed refresh

(C) Hidden refresh

(D) Open refresh

8. Which of the following 8 bit microprocessors has maximum addressing modes ?

(A) 8085

(B) Z 80

(C) 6800

(D) 6809

9. Which of the following can be accessed only sequentially ?

(A) Floppy disk

(B) Hard disk

(C) Magnetic tape

(D) ROM

10. In a rectangular wave guide cutoff wavelength for TE_{10} mode is 8 cm. Then cutoff wavelength for TE_{20} mode is

(A) 8 cm

(B) 6 cm

(C) 4 cm

(D) 2 cm

11. According to Barkhausen criterion,

(A) $|\beta A| = 1$

(B) $\beta A = 29$

(C) $\beta A = 1/29$

(D) $\beta A = 0$

12. The number of RC sections required in a phase-oscillator is

(A) 1

(B) 2

(C) 3

(D) 4

13. A Darlington pair consists of

(A) two CB amplifiers

(B) two CC amplifiers

(C) two cascaded CC amplifiers

(D) two cascaded CE amplifiers

14. In a push pull circuit

(A) each transistor conducts for 180°

(B) each transistor conducts for more than 180^0 but less than 360°

(C) each transistor conducts for less than 180°

(D) the period of conduction of each transistor depends on circuit configuration

15. In an oscillator the total phase shift around the loop must be

(A) 180°

(B) 90°

(C) 270°

(D) 0°

16. One of the following is a volatile memory device :

(A) Hard disk

(B) Floppy disk

(C) RAM

(D) Magnetic tape

17. In a moving coil meter movement, pole pieces are used

(A) to provide damping

(B) to overcome damping

(C) to yield accurate results

(D) to concentrate the magnetic field in the space surrounding the coil

18. One of the following material constants determines the gauge factor of the resistance wire strain gauge.
(A) Young's modulus of elasticity
(B) Poisson's ratio
(C) Resistivity
(D) Thermal conductivity

19. One of the following transducers is used for measurement of very small linear displacements :
(A) LVDT
(B) Pirani Gauge
(C) Thermocouple
(D) Shaft encoder

20. The down-link frequency in a C-band transponder is about
(A) 6 GHz
(B) 4 GHz
(C) 14 GHz
(D) 11 GHz

21. For the earth station antennas to be 6 feet in diameter, the satellite frequency bands must be in
(A) 4/6 GHz range
(B) 12/14 GHz
(C) 20/30 GHz range
(D) both (A) and (B)

22. The satellite orbit almost invariably used with remote sensing satellites is
(A) Geostationary orbit
(B) Geosynchronous orbit
(C) Sun synchronous orbit
(D) Molniya orbit

23. The location of a geostationary satellite is always given in terms of
(A) a certain longitude
(B) a certain latitude
(C) longitude and latitude
(D) distance from earth's surface

24. The orbital velocity of the satellite
(A) is directly proportional to its distance from earth's surface
(B) is inversely proportional to square root of its distance from earth's centre
(C) depends upon the thrust with which it is launched
(D) is continuously changing as the satellite revolves

25. The number of geostationary satellites needed for uninterrupted global coverage is
(A) 3
(B) 4
(C) 1
(D) 2

26. The computer port used for connecting Modems is
(A) Parallel Port
(B) SCSI port
(C) Serial Port
(D) USB

27. A network architecture that is not a client / server type of architecture and where all computers are equals :
(A) Star connected network
(B) Ring network
(C) Peer-to-Peer network
(D) Bus Network

28. As compared to secondary storage media, primary storage media are relatively
(A) faster and more expensive
(B) faster and cheaper
(C) slower and cheaper
(D) slower and more expensive

29. Computers on one network can communicate with computers on another network via a
(A) Gateway
(B) File Server
(C) Utility Server
(D) Main frame computer

30. In the abbreviation CCITT, the last 'T' stands for
(A) Telephone
(B) Telecommunication
(C) Telegraph
(D) Television

31. Which of the following is a personal computer application software ?
(A) COBOL
(B) FORTRAN
(C) BASIC
(D) Power Point

32. In PCM system each quantization level is encoded into 8 bits. The signal to quantization noise ratio is equal to
(A) 1/12
(B) 48 dB
(C) 64 dB
(D) 256 dB

33. The transferred-electron effect is found in
(A) silicon
(B) gallium arsenide
(C) germanium
(D) metal semiconductor junctions

34. Gunn effect
(A) is a junction effect
(B) occurs only in p-type materials
(C) is affected by magnetic fields
(D) occurs only in n-type materials

35. The hot-electron diode is the same as
(A) Gunn diode
(B) Shottky-Barrier diode
(C) PIN diode
(D) IMPATT diode

36. The Fourier transform of a Gaussian time pulse is
(A) uniform
(B) a pair of impulses
(C) Gaussian
(D) Raleigh

37. Maxwell's Divergence equation for the magnetic field is given by
(A) $\nabla \times B = 0$
(B) $\nabla \cdot B = 0$
(C) $\nabla \times B = \rho$
(D) $\nabla \cdot B = \rho$

38. The work done in moving a charge Q on an equipotential line for a distance 'd' will be
(A) Zero
(B) Q.d
(C) V/d
(D) QV/d

39. An amplifier without feedback has a gain of 1000. The gain with a negative feed back of 0.009 is

(A) 1000

(B) 100

(C) 10

(D) 125

40. A carrier is simultaneously modulated by two sine waves with modulation indices of 0.3 and 0.4; the total modulation index

(A) is 1

(B) cannot be calculated unless the phase relations are known

(C) is 0.5

(D) is 0.7

41. In energy band diagram of n type semi conductor, the donor energy level is

(A) In valence band.

(B) In conduction band.

(C) Slightly above valence band.

(D) Slightly below conduction band.

42. A unity –feed back control system has the open – loop transfer function. $G(s) = 4(1+2s) / s^2(s+2)$. If the input to the system is a unit ramp, the steady – state error will be

(A) 0

(B) 0.5

(C) 2

(D) Infinity

43. The seven bit Hamming code as received is 0010001. If even parity has been used, the correct code is

(A) 001001

(B) 1110001

(C) 0110001

(D) 0011001

44. For a 4096×8 EPROM, the number of address lines is

(A) 14

(B) 12

(C) 10

(D) 8

45. The open – loop transfer function of a feed back control system is $G(s)H(s) = 1/(s+1)^3$. The gain margin of the system is

(A) 2
(B) 4
(C) 8
(D) 16

46. Following distortion occurs in Flat top sampling.

(A) Aliasing effect distortion
(B) Cross over distortion
(C) Aperture effect distortion.
(D) ISI

47. In QAM, the digital information is contained in

(A) amplitude
(B) phase
(C) both amplitude and phase
(D) frequency

48. A 'rat race' is a

(A) hybrid junction for microwaves
(B) microwave oscillator
(C) a microwave amplifier
(D) a microwave antenna

49. If the differential voltage gain and the common mode voltage gain of a differential amplifier are 45 dB and 2 dB respectively, then its common mode rejection ratio is

(A) 23 dB
(B) 25 dB
(C) 46 dB
(D) 50 dB

50. The minimum number of comparators required to build on 8 bit flash ADC is

(A) 8
(B) 63
(C) 255
(D) 256

51. The case code amplifier is a multistage configuration of

(A) CC – CB

(B) CE – CB

(C) CB – CC

(D) CE – CC

52. In a 4-bit weighted - resistor D/A converter the resistor value corresponding to LSB is 16 k Ω. The resistor value corresponding to the MSB will be

(A) 1 k Ω

(B) 2 k Ω

(C) 4 k Ω

(D) 16 k Ω

53. In 8086 the flag which enables or disables external interrupts is

(A) IF

(B) DF

(C) TF

(D) CF

54. The transition capacitance C_T is related to the reverse bias | Vr | of a step graded pn junction as

(A) $C_T \alpha |Vr|$

(B) $C_T \alpha |Vr|^{½}$

(C) $C_T \alpha |Vr|^{-½}$

(D) $C_T \alpha\alpha |Vr|^2$

55. A silicon PN junction diode under reverse bias has depletion region of width 10 μm. The relative permittivity of Silicon $\varepsilon_r = 11.7$ and the permittivity of free space $\varepsilon_0 = 8.85 \times 10^{-12}$ F/m. The depletion capacitance of the diode per square metre is

(A) 100.3 μF

(B) 10.3 μF

(C) 1.3 μF

(D) 20 μF

56. The effect of introducing Re in the CE amplifier is to

(A) Increase the voltage gain

(B) Decrease the voltage gain

(C) Increase the current gain

(D) Decrease the current gain

57. In 8085 which address mode is also called inherent addressing ?

(A) direct

(B) register

(C) implicit

(D) immediate

58. Which addressing mode is suitable only for these instructions in which there is only one operand ?

(A) implicit

(B) register

(C) direct

(D) immediate

59. How is inversion achieved using EX-OR gate ?

(A) Giving input signal to the two input lines of the gate tied together.

(B) Giving input to one input line and logic zero to the other line.

(C) Giving input to one input line and logic one to the other line.

(D) Inversion cannot be achieved using EX-OR gate.

60. The number of unused states in a 4-bit Johnson counter is

(A) 2

(B) 4

(C) 8

(D) 12

61. A 4-bit binary ripple counter uses flip-flop with a propagation delay time of 25ns each. The maximum possible time required for change of state will be

(A) 25 ns

(B) 50 ns

(C) 5 ns

(D) 100 ns

62. Which of the following is class B network address ?

(A) 128.4.5.6

(B) 127.4.5.0

(C) 127.0.0.0

(D) 127.8.0.0

63. An analog signal has significant spectral components from 1 kHz to 5 kHz. What is the Nyquist sampling rate for this signal ?

(A) 5 k samples/s

(B) 4 k samples/s

(C) 8 k samples/s

(D) 10 k samples/s

64. If the short circuit and open circuit impedance of a line are 5 and 20 Ω respectively the characteristic impedance is given by

(A) 100 Ω

(B) 10 Ω

(C) 15 Ω

(D) 10000 Ω

65. The term 'delayed AGC' implies

(A) Application of AGC after switch of on-off switch

(B) Application of AGC to the last stage of receiver

(C) Application of AC after one time lag

(D) Application of AGC only when signal strength has increased beyond a specified value

66. If x(t) and its first derivative are Laplace transformable and Laplace transform of x(t) is X(s), then $\lim_{t \to 0} x(t)$ is

(A) $\lim_{s \to \infty} sX(s)$

(B) $\lim_{s \to 0} sX(s)$

(C) $\lim_{s \to \infty} X(s)/s$

(D) $\lim_{s \to 0} X(s)/s$

67. If $X_k=(-1/2)^k$ for $k \geq 0$ and $X_k= 0$ for $k < 0$, Z transform of the sequence X is

(A) $z/z + 0.5$
(B) $1/z + 0.5$
(C) $2/z + 0.5$
(D) $1/2z + 0.5$

68. Which of the following antennas can be used in direction finding ?

(A) Loop antenna

(B) Long-wire antenna

(C) Broad-side array

(D) Yagi-Uda antenna

69. The ground wave coverage of the medium wave transmitter is 100 km and in the night the first reflected ray is at 800 km. The skip distance is

(A) 900 km

(B) 700 km

(C) 100 km

(D) 800 km

70. When N is the maximum electron density in per cubic metre, then critical frequency f_c is

(A) $9\ N$

(B) $9\ N^{3/2}$

(C) $9\ \sqrt{N}$

(D) $9/\sqrt{N}$

71. A fetch cycle is the
(A) First part of the instruction cycle
(B) Last part of the instruction cycle
(C) Intermediate part of the instruction cycle
(D) Auxiliary part of the instruction cycle

72. In 8085, TRAP is
(A) always maskable
(B) cannot interrupt a service sub-routine
(C) used for catastrophic events like temporary power failure
(D) lowest priority interrupt

73. The time taken for the output signal to rise from 10% to 90% of the input signal is called

(A) Transit time

(B) Rise time

(C) Tilt time

(D) Storage time

74. A certain transistor has α_{dc} of 0.98 and collector leakage current of 5μA. If the I_E =1 mA, the collector current will be

(A) 1.005 mA

(B) 0.985 mA

(C) 0.975 mA

(D) 0.995 mA

75. Two isotropic antennas are separated by a distance of two wavelengths. If both the antennas are fed with current of equal phase and magnitude, the number of lobes in the radiation pattern in the horizontal plane are

(A) 2

(B) 4

(C) 6

(D) 8

76. For a two port network to be reciprocal

(A) $Z_{11} = Z_{22}$

(B) $y_{12} = y_{21}$

(C) $h_{21} = -h_{12}$

(D) AD – BC = 0

77. The network function F(s) = (s+2) / (s+1) (s+3) represents

(A) RC Impedance

(B) RL Impedance

(C) RC Impedance and RL Admittance

(D) RC admittance and RL impedance

78. Which one of the following circuits can be used as a high pass filter ?

(A) Differentiator

(B) Integrator

(C) Astable

(D) Bistable

79. Amplitude limiting is not explicitly needed in

(A) Slope detector

(B) Balanced slope detector

(C) Foster Seeley discrimination

(D) Ratio detector

80. For a type 1 system and unit step input, the steady state error is

(A) 0

(B) 1

(C) $1 / 1+K_p$

(D) ∞

81. In terms of Z-parameters, the condition for the network to be passive is

(A) $Z_{11} = Z_{22}$

(B) $Z_{12} = Z_{21}$

(C) $Z_{12} = 0$

(D) $Z_{22} = 0$

82. The autocorrelation of a sampling function is a

(A) Triangular function

(B) Gate function

(C) Signum function

(D) Step function

83. For a BJT $\alpha = 0.98$, then $\beta =$

(A) 0.02

(B) 0.5

(C) 4.9

(D) 49

84. Coasta's receiver is used for

(A) coherent detection of AM-SC signal

(B) asynchronous detection of AM-SC signal

(C) amplitude modulation of signal

(D) frequency modulation of signal

85. When modulation index of AM wave is increased from 0.5 to 1, the transmitted power

(A) remains the same

(B) increases by 33.3%

(C) increases by 25%

(D) increases by 50%

86. In a AM wave the carrier and one of the side bands is suppressed. If m = 0.5, the percentage of saving power is

(A) 50%

(B) 83.3%

(C) 94.4%

(D) 100%

87. Impedance inversion may be obtained with

(A) Short – circuited stub

(B) An open circuited stub

(C) A quarter wave line

(D) A half wave line

88. Insertion of a dielectric material between the plates of an air capacitor

(A) increases the capacitance

(B) decreases capacitance

(C) has no effect on capacitance

(D) increases breakdown voltage

89. Which mode is called dominant mode in rectangular wave guide ?

(A) TE_{01}

(B) TE_{11}

(C) TE_{10}

(D) TE_{20}

90. A reflex klystron oscillator uses

(A) one cavity resonator

(B) two cavity resonators

(C) three cavity resonators

(D) four cavity resonators

91. In a broad side array of 20 isotropic radiators, equally spaced at a distance of $\lambda/2$, the beam width between first nulls is

(A) 51.3 degrees

(B) 11.46 degrees

(C) 22.9 degrees

(D) 102.6 degrees

92. The ideal OP- AMP has the following characteristics.

(A) $R_i = \infty$, $A = \infty$, $R_o = 0$

(B) $R_i = 0$, $A = \infty$, $R_o = 0$

(C) $R_i = \infty$, $A = \infty$, $R_o = \infty$

(D) $R_i = 0$, $A = \infty$, $R_o = \infty$

93. Consider a system with the transfer function $G(s) = s + 6 / ks^2 + s + 6$. Its damping ratio will be 0.5 when the value of k is

(A) 2/6

(B) 3

(C) 1/6

(D) 6

94. The maximum usable frequency of an ionospheric layer at 60^o incidence and with 8 MHz critical frequency is

(A) 16 MHz

(B) $16/\sqrt{3}$ MHz

(C) 8 MHz

(D) about 6.93 MHz

95. A transmission line having 50 Ω impedance is terminated in a load of (40+j30) Ω. The VSWR is

(A) j 0.033

(B) 0.8 + j 0.6

(C) 1

(D) 2

96. Degaussing coil is used in a colour TV tube to

(A) increase screen brightness

(B) reduce X-ray emission

(C) ensure that each beam hits only its own dots

(D) reduce the effect of earth's magnetic field

97. In a TV receiver the contrast is controlled by

(A) AC voltage in video signal

(B) DC voltage in video signal

(C) Signal brightness

(D) Noise

98. If the unit step response of a network is $(1- e^{-\alpha t})$, then its unit impulse response will be

(A) $\alpha . e^{-\alpha t}$

(B) $\alpha . e^{-t/\alpha}$

(C) $1/(\alpha . e^{-\alpha t})$

(D) $(1-\alpha) e^{-\alpha t}$

99. A folded dipole normally has an impedance of

(A) 72 ohms

(B) 50 ohms

(C) 288 ohms

(D) 600 ohms

100. A super-heterodyne radio receiver with an intermediate frequency of 455 kHz is tuned to a station operating at 1200 kHz. The associated image frequency is

(A) 555 kHz

(B) 1110 kHz

(C) 2110 kHz

(D) 4220 kHz

101. Type A scope in RADAR systems displays

(A) Target Azimuth angle and range

(B) Target range alone

(C) Target Azimuth angle alone

(D) Type of target

102. Cassegrain feed is used with a parabolic reflector to

(A) increase the beam width of a system

(B) increase the gain of the system

(C) allow the feed to be placed at a convenient point

(D) reduce the size of the main reflector

103. An energy signal has $F(\omega) = 5$. Its energy density spectrum is

(A) 10

(B) 5

(C) 25

(D) 1

104. An amplifier having noise figure of 20 dB and available power gain of 15 dB is followed by a mixer circuit having noise figure of 9 dB. The overall noise figure as referred to input in dB is

(A) 11.07

(B) 10.44

(C) 21.52

(D) 0.63

105. The positive RF peaks of an AM voltage rise to a maximum value of 12 V and drop to a minimum value of 4V. The modulation index assuming single tone modulation is

(A) 3

(B) 1/3

(C) ¼

(D) ½

106. Decimal 46 in excess-3 code =

(A) 1000 1001

(B) 0111 1001

(C) 0111 1111

(D) 1000 1111

107. A broad cast radio transmitter radiates 20 kW when the modulation percentage is 60. The carrier power will be

(A) 1.2 kW

(B) 1.45 kW

(C) 16.94 kW

(D) 20 kW

108. A unit step voltage is applied at t = 0 to a series RL circuit with zero initial conditions

(A) It is possible for the current to be oscillatory

(B) The voltage across the resistor at t = 0 is zero

(C) The energy stored in the inductor in the steady state is zero

(D) The resistor current eventually falls to zero

109. The graph of an electrical network has N nodes and B branches. The number of links, L with respect to the choice of a tree, is given by

(A) B – N + 1

(B) B + N

(C) N– B + 1

(D) N – 2B – 1

110. A series R-L-C circuit has R = 50 Ω ; L = 100 μH and C = 1 μF. The lower half power frequency of the circuit is

(A) 30.55 kHz

(B) 3.055 kHz

(C) 51.92 kHz

(D) 1.92 kHz

111. In terms of R,L,G and C, the propagation constant γ of a transmission line is

(A) $\sqrt{(R+j\omega L)}$

(B) $\sqrt{(R+j\omega L)}\ (G+j\omega C)$

(C) $\sqrt{(G+j\omega C)}$

(D) $\sqrt{(R+j\omega L)} / (G+j\omega C)$

112. Which of the following line behaves as infinite line ?

(A) A line terminated in inductance

(B) A line terminated in capacitance

(C) A short line

(D) A line terminated in Zo

113. An ideal current source has

(A) infinite source resistance

(B) zero source resistance

(C) large value of source resistance

(D) finite value of source resistance

114. When determining Thevinin's resistance of a circuit

(A) all sources must be open circuited

(B) all sources must be short circuited

(C) all voltage sources must be open circuited and all current sources must be short circuited

(D) all sources must be replaced by their internal resistances

115. Which of the following is basically a voltage controlled capacitance ?

(A) Zener diode

(B) Diode

(C) Varactor Diode

(D) LED

116. The bandwidth of an 'n' stage amplifier with each stage having a bandwidth B is

(A) B/n

(B) $B/\sqrt{n}$

(C) $B / \sqrt{2^{1/n} - 1}$

(D) $B/\sqrt{2^{1/n-1}}$

117. In a JK Master slave flip flop

(A) Master is clocked when clock is low.

(B) Slave is clocked when clock is high.

(C) Master is clocked when clock is high and slave is clocked when clock is low.

(D) Master is clocked when clock is low and slave is clocked when clock is high.

118. A binary ladder network D/A converter requires

(A) Resistors of one value only

(B) Resistors of many different values

(C) Resistors of two different values

(D) Resistors of four different values

119. Flash ADC is

(A) Serial ADC

(B) Parallel ADC

(C) Series – Parallel ADC

(D) Successive approximation ADC

120. In a system, the probabilities of message occurrence are 1/8, 1/3, 3/8 and 3/8. The average information will be

(A) 8 bits/message

(B) 3 bits/message

(C) 1.8 bits /message

(D) 4 bits/message

Space For Rough Work