1. In IC, transistors are utilised as diodes.To get highest breakdown voltage for such diode, it is adjusted to have
   A) Ie=0 B) Ic=0 C) Vcb=0 D) Vce=0

2. When Aluminium is deposited directly upon N type semiconductor, the diode formed has the characteristic
   A) Forward current due to minority carriers
   B) Small delay time from on to off
   C) Large storage time
   D) Higher break down voltage

3. In IC fabrication, the common form of PNP transistor is
   A) Vertical PNP B) Lateral PNP
   C) Triple diffusion PNP D) Substrate PNP

4. For fabricating cost effective high valued integrated resistors in IC, the method used is
   A) Diffused resistor B) Epitaxial resistor
   C) Pinched resistor D) Thin film resistor

5. The type number CA3741 operational amplifier(op-amp) is manufactured by
   A) RCA B) Texas instruments
   C) Signetics D) Motorola

6. For a symmetrical emitter coupled differential amplifier using transistors of current gain 100, constant current source of 2 mA and with Vcc=10 V, differential input resistance in kOhm is about
   A) 2.5 B) 5
   C) 10 D) 50

7. Compared to MOSFET operational amplifier, BJT operational amplifier has
   A) Higher input resistance B) Higher slew rate
   C) Lower input current D) Higher voltage gain

8. The total output offset voltage for a noninverting amplifier with input resistance 1 kOhm , feedback resistance 10 k Ohm, input offset voltage 10 mV and input bias current 100 nA is, about
   A) 25 mV B) 55 mV
   C) 110 mV D) 220 mV

9. A dominant pole compensated op-amp has openloop gain of 100 dB and -3 dB bandwidth of 50 Hz. If it is connected as inverting amplifier for a gain of 20 dB the -3 dB bandwidth is about
   A) 500 kHz B) 50 kHz
   C) 5 kHz D) 500 Hz

10. Speed of improvement of computation of 64 point DFT by using FFT compared to direct computation is about
A) 4 B) 8
C) 16 D) 20

11. Peak sidelobe amplitude (relative) of -57 dB is provided by the window function
A) Hamming B) Blackman
C) Hanning D) Bartlet

12. Orbital altitude of MEO satellite is in the range of
A) (10000 -20000) km B) (750-1500)km
C) (200-600)km D) None of these

13. Modal dispersion problem in optical fiber is less in
A) Step index single mode fiber
B) Step index multimode fiber
C) Graded index multimode fiber
D) Fiber with V number > 20

14. In optical fiber, absorption loss peak occurs at wavelength (in nm) of about
A) 80 B) 1050
C) 1380 D) 1600

15. The S to Z domain transformation in digital filters which transforms imaginary axis to perimeter of unit circle with no aliasing error is
A) Backward difference integration
B) Forward difference integration
C) Impulse invariant transformation
D) Bilinear integration

16. In CCIR PAL B Television standards, sound IF (in MHz) is at
A) 30.5 B) 33.4 C) 32.9 D) 37.1

17. Television channel allocation (in MHz) for VHF band III is
A) 47-68 B) 174-230 C) 470-582 D) 606-870

18. In satellite communication, Ku band (in GHz) refers to
A) 4-8 B) 8-12 C) 12-18 D) 18-27

19. Orbital velocity (in km/S) of Geosynchronous satellite is about
A) 1.83 B) 2.62 C) 2.91 D) 3.07

20. On Smith chart, the eccentric circle passing through the prime center represents (in Ohms)
A) R=0 B) R=1
C) Xc=0 D) R=infinity

21. Output of an op-amp is a square wave of 4 V peak to peak with a rise time of 5 microsecond and fall time of 4 microsecond.Maximum frequency (in kHz)of undistorted sine wave output of 2 V peak to peak is about
A) 100 B) 150 C) 200 D) 250

22. Timer IC 555 has no pin for
A) Threshold B) Set C) Trigger D) Control

23. Timing resistor of a monostable using 555 is 100 kOhm. The timing capacitance (in nF) required for pulsewidth of 100mS is about
A) 100 B) 300 C) 600 D) 900

24. Angles in degrees of pole locations of 4^{th} order Butterworth low pass filter approximation from either real axis are
A) +45,-45,+30,-30 B) +67.5,-67.5,+45,-45
C) +30,-30,+22.5,-22.5 D) +67.5,-67.5,+22.5,-22.5

25. Maximum phase distortion is encountered when using the filter approximation
A) Elliptic B) Butterworth
C) Chebyshev I D) Inverse Chebyshev

26. For an analog PLL, under perfect locking condition, the phase difference (in degrees) between input signal and VCO output should be
A) 0 B) 90
C) 120 D) 180

27. In PLL 565, timing components of VCO are 10 kOhm and 0.01 microfarad. Supply voltage is +10V and -10V. The voltage to frequency conversion factor of VCO is about
A) 250 Hz/V B) 500 Hz/V
C) 750 Hz/V D) 1000 Hz/V

28. The lock range of PLL is not governed by
A) Low pass filter B) VCO
C) Amplifier D) Phase detector

29. A circular radiation pattern is obtained using
A) Travelling wave antenna (TWA)
B) Rhombic antenna
C) Yagi antenna
D) Turnstile antenna

30. AM transmitter operating below about 5 MHz usually make use of
A) Marconi antenna B) Turnstile antenna
C) Hertz dipole D) Folded dipole

31. Propagation medium of the signal in band (3 to 30) MHz is by
A) Space wave B) Surface wave
C) Sky wave D) LOS

32. For a JFET, drain saturation current is 10 mA with Vdd=10 V, Vp= -5V and Vgs= -2 V, drain current in mA is
A) 12.5 B) 8.4
C) 6.2 D) 3.6

33. Compared to wire resistance transducers, for temperature measurement, thermistors have advantage of
A) Low value temperature coefficient
B) High thermal capacity
C) High speed of response
D) Large size

34. Gauge factor of about 5 can be obtained using strain gauge made of
A) Constantan B) Ferry
C) Nichrome V D) Platinum

35. Capacitive transducers for displacement are characterised by
A) Mechanical coupling B) Loading
C) Noninvasive D) Nonideal displacement

36. For an NMOS transistor, Vt= 2 V, Vgs= 3 V, Vdd= 10 V, nCox=20 A/V^2, L=10 meter, W= 400 meter. The drain current (in mA) is
A) 2 B) 1.2 C) 0.4 D) 0.2

37. A carrier signal of 600 V rms with 75% amplitude modulation is applied to 75 ohm antenna. The total side band power (in watts) is
A) 4800 B) 450 C) 950 D) 1350

38. Maximum junction temperature and maximum ambient temperature of a power transistor (in degree Centigrade) are 150 and 52. The set level power dissipation is 32 watts, transistor thermal factor is 0.7 and of mica washer is 0.5.Thermal resistivity of heat sink (in degree C/W) is
A) 1.8 B) 3.2 C) 6.4 D) 9.8

39. The microprocessor 68020 has been developed by
A) Motorola B) Zilog C) Intel D) Texas

40. The FM radio broad cast frequency band (in MHz) is
A) 68-98 B) 88 -108
C) 148 – 268 D) None of these

41. 8051 microcontroller is capable of accessing external memory of
A) 128k B) 64k C) 32k D) 16k

42. Typical bit rate in kbps for voice encoding using DM technique is
A) 32-48 B) 48-64 C) 64-128 D) 132-248

43. If modulation index is 0.6, maximum power efficiency (in %) of AM is about
A) 60 B) 30 C) 20 D) 10

44. One advantage of AM over suppressed carrier AM is
A) Less power B) Less bandwidth
C) Simpler detection D) Higher efficiency

45. The bandwidth and S/N of a communication system are 3MHz and 30dB respectively. The channel capacity (in Mbps) is around
A) 30 B) 300
C) 0.3 D) None of these

46. Rise time of an amplifier is found to be 1.0 S, its bandwidth (in kHz) is around
A) 2200 B) 1000 C) 350 D) 220

47. An emitter resistor is included in CE amplifier to increase
A) Gain B) Bandwidth C) S/N D) Stability

48. Transresistance amplifier has the characteristics of
A) Higher input resistance and lower output resistance
B) Lower input resistance and lower output resistance
C) Higher input resistance and higher output resistance
D) Lower input resistance and higher output resistance

49. Frequency stability of crystal oscillator is due to its
A) Low Q B) Low loss
C) High feed back D) High bandwidth

50. For a CE amplifier, operating current is 1mA, load resistance is 5 kOhm.The forward bias capacitance is 50 nF and reverse bias capacitance is 10 nF. Total input capacitance in nF is around
A) 40 B) 60
C) 500 D) 2000

51. For a transistor, Ceb=20pF, Ccb=5pF, re=1kOhm. Its figure of merit (in MHz) is about
A) 65 B) 650
C) 130 D) 13

52. If Φ = angle(G(jw)H(jw)) where w is the gain crossover frequency of Bode plot of the system, phase margin is

A) $-180+\Phi$ B) $180-\Phi$

C) $180+\Phi$ D) $-180-\Phi$

53. If all transmission zeros of a network are at origin, it is a

A) HPF B) LPF

C) BPF D) BEF

54. The inverse Laplace trasform of $w/[(s+a)^2 - w^2]$ is

A) $e^{-at}\cos(wt)$ B) $e^{-at}\sin(wt)$

C) $e^{-at}\cosh(wt)$ D) $e^{-at}\mathrm{Sinh}(wt)$

55. Bandwidth of an RC coupled amplifier is 100 kHz. Two such amplifiers are connected in cascade.Resultant bandwidth(in kHz) is around

A) 200 B) 100

C) 60 D) 30

56. An amplifier which has almost same gain and input resistance of a CE amplifier but of higher bandwidth is

A) Cascode amplifier B) Cascade amplifier

C) Darligton amplfier D) CC amplifier

57. Width of forbidden energyband (in eV) of a semiconductor (eg.silicon) is around

A) 10 B) 6 C) 1 D) 0.1

58. Velocity of an electron (in km/S) starting at rest and travelling to a point 100 V above the starting potential is around

A) 3600 B) 4000 C) 5100 D) 6000

59. An electron having an energy of 20 eV enters a magnetic field of 0.02 webers/sqm at an angle of 30degrees to the field. The time of travel (in nS)of the electron for one revolution is about

A) 1.78 B) 4.21 C) 7.82 D) 10.24

60. Deflection of electron beam in a CRT is

A) Inversly proportional to length of deflecting plates

B) Directly proportional to distance between plates

C) Inversly proportional to deflecting potential

D) Inversly proportional to accelerating potential

61. The type of phospher used in CRT used for television is

A) P11 B) P4 C) P2 D) P1

62. At very high freqencies the type of diode used for rectification is
A) Abrupt junction B) Graded junction
C) Point contact D) Tunnel

63. One of the necessary and sufficient condition for a network function N(s)=p(s)/q(s) to be a transfer function is that
A) The coefficients of the polynomial p(s) and q(s) must be real and those for q(s) must be positive
B) Coefficients of p(s) and q(s) must be real and positive
C) Coefficients of p(s) must be positive and real but coefficients of q(s) can be negative also
D) Degree of p(s) and q(s) may differ by either zero or one only

64. Poles which produce high Q factor in active RC filters are
A) On the negative real axis close to origin
B) On the negative real axis away from origin
C) Complex poles away from imaginary axis
D) Complex poles near the imaginary axis

65. The system described by the characteristic equation $S^4+2S^3+3S^2+4s+5=0$ has
A) No roots have positive real part
B) One root has positive real part
C) Two roots have the positive real parts
D) None of these

66. Condition for reciprocity and symmetry of a two port network are respectively
A) $Z_{11}=Z_{22}$ and $Z_{12}=Z_{21}$ B) $Z_{11}=Z_{12}$ and $Z_{22}=Z_{21}$
C) $Z_{12}=Z_{21}$ and $Z_{11}=Z_{22}$ D) $Z_{22}=Z_{21}$ and $Z_{22}=Z_{12}$

67. For a two port network, with output shorted, V1=25V, I1=1 A,I2=2A. With input open circuited, V1=10 V,V2= 50 V,I2= 2 A. h_{12} and h_{21} are
A) 0.2 and 25 B) 25 and 0.2
C) 0.4 and 2 D) 0.2 and 2

68. An air core transformer has primary and secondary inductors of 8mH and 10 mH respectively. The mutual inductance is 5mH. The coefficient of coupling is
A) 1/8 B) 1/6
C) $\frac{1}{4}$ D) $\frac{1}{2}$

69. An op-amp can be represented by
A) Norator at input and Nullator at output
B) Norator at output and Nullator at input
C) Norator at input and output
D) Nullator at input and output

70. The 8259 peripheral chip for 8055 microprocessor is a
A) Programmable interval timer
B) DMA controller
C) Priority interrupt controller
D) Programmable keyboard interface

71. The maximum data transmission rate of IEEE-488 bus in kbytes/S is
A) 100 B) 250 C) 600 D) 1000

72. The bit addressable RAM of 8051 are at byte location (in Hex)
A) 20-2F B) 80-FF C) 30-7F D) 30-FF

73. On chip oscillator of 8051 has a nominal frequency (in MHz) of
A) 2 B) 8 C) 10 D) 12

74. In 8085 instruction SBBr takes
A) 2 cycles and 7T states B) 1 cycle and 4T states
C) 5 cycles and 16T states D) 3 cycles and 9Tstates

75. In the order of priority of hardware interrupts of 8085A, 3rd priority (in descending order) is for
A) Trap B) INTR C) RST6.5 D) RST5.5

76. In the flag register, parity flag is at bit location
A) B0 B) B2 C) B4 D) B5

77. In the command instruction word of USART 8251, transmitter is enabled by setting
A) D0 B) D1 C) D2 D) D7

78. The current in a 2 F capacitor is given by $i(t)=10^{-3}\exp(-100t)$. The capacitor is initially uncharged. Instantaneous power due to the current is
A) $5\exp(-100t)$ B) $5(1-\exp(-100t))$
C) $5(\exp(-100t)-\exp(-200t))10^{-3}$ D) $5(1-\exp(-200t))10^{-3}$

79. A twin T network is a filter of kind
A) BEF B) LPF
C) HPF D) BPF

80. Fourier transform of $f1(t)f2(t)$ is
A) $F1(jw)*F2(jw)$ B) $[F1(jw)*F2(jw)](1/2\Pi)$
C) $[F(jw)*F2(jw)]2\Pi$ D) $F1(jw)*F2(jw)\exp(-w)$

81. For an 8 bit DAC, reference voltage is 10 V. If input to DAC starting from MSB is 10111100, output (in volts) is
A) 5.8 B) 6.4 C) 7.3 D) 8.2

82. In 8 bit successive approximation ADC, clock frequency is 1MHz and reference voltage is 10 V.Conversion time in S for 5 V input is
A) 4 B) 8
C) 10 D) None of these

83. For an ADC, full scale output voltage is about 10 V.For a resolution of about 9.78mV, number of bits required is
A) 6 B) 8 C) 10 D) 12

84. The emf induced in a coil is 1 volt when current in it changes from 0 to 100 mA in time 10mS. Its inductance (in mH) value is
A) 10 B) 50 C) 100 D) 1000

85. A coil has 100 turns produces a flux change of 0.01 webers when current changes by 100mA. Its inductance (in H) value is
A) 5 B) 10 C) 1 D) 0.1

86. In-circuit erasing and programming (without uv light) is done in the case of
A) MROM B) PROM
C) EPROM D) EEPROM

87. The device complexity is highest for memory
A) Flash B) EEPROM
C) PROM D) EPROM

88. DRAM has the characteristics compared to
A) Higher power consumption B) Lower power consumption
C) Higher size D) Higher cost

89. Convolution of exp (-at) and exp(-bt) is
A) exp(-(a+b)t) B) exp(-abt)
C) exp(-bt)-exp(at) D) None of these

90. Response of exp(-2t) of system function 1/(S+1) is
A) exp(-3t) B) exp(-t)+exp(-2t)
C) exp(-t)-exp(-2t) D) None of these

91. A self complementary BCD code is
A) 7421 code B) 5421 code
C) 2421 code D) 5311 code

92. The 7 bit ASCII code of character H is
A) C8 B) 48 C) 51 D) 5A

93. A functionally complete operation set of logic gates is
A) AND and NOT B) OR and NOT
C) AND and OR D) EXOR and AND

94. Number of minterms of function f(a,b,c)=ab'+ac'+bc is
A) 3 B) 4 C) 5 D) 6

95. The POS of the function Π (2,4,5) is
A) (x' + y)(x + y' +z) B) (x + y')(x'+y+z')
C) (x' +y)(x' +y +z') D) None of these

96. Recommended I_{iL} (minimum input current when the input voltage represents logical zero) is minimum for the TTL family
A) LS B) ALS C) AS D) S

97. In the snubber circuit used in a thyristor to limit the peak voltage overshoot applied across it damping ratio is taken as about
A) 0.14 B) 0.21 C) 0.36 D) 0.62

98. A diode D, resistor R and inductor L and a switch S are connected in series.When a voltage V is applied across the circuit and switch is put on, the voltage across L changes as
A) V(1-exp(-t R/L)) B) Vexp(-t R/L)
C) Ldi/dt +Ri D) V(1-t R/L)

99. The switching time (in S) of IGBT is in the range of
A) 20 B) 10 C) 2 D) 0.5

100. In the selenium cell photovoltaic transducer, relative spectral sensitivity maximum occurs in the wavelength (in nm) of about
A) 300 B) 350 C) 460 D) 550

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