ECET 2012

ELECTRONICS AND COMMUNICATION ENGINEERING

1. In a pn junction diode, if the junction current is zero, this means that ( )

   (1) there is no carriers crossing the junction

   (2) the number of majority carriers crossing the junction equals the number of minority carriers crossing the junction

   (3) the number of holes diffusing from the p-region equals the number of electrons diffusing from the n-region

   (4) the potential barriers has disappeared

2. The circuit shown in Fig. 1 acts as ( )

   (1) clamper

   (2) rectifier

   (3) comparator

   (4) clipper

Fig. 1

3. The emitter region in the pnp junction transistor is more heavily doped than the base region so that ( )

   (1) base current will be high

   (2) the flow across the base region will be mainly because of electrons

   (3) recombinations will be increased in the base region

   (4) the flow across the base region will be mainly because of holes

4. A field-effect transistor (FET) ( )

   (1) depends on minority-carrier flow

   (2) uses high concentration emitter junction

   (3) has a very high input resistance

   (4) uses forward-biased pn junction

5. In a half wave rectifier, the load current flows for   ( )

    (1) only for positive half cycle of input signal

    (2) the complete cycle of the input signal

    (3) more than half cycle but less than the complete cycle of input signal

    (4) less than half cycle of input signal

6. A transistor is said to be in a quiescent state when   ( )

    (1) no currents are flowing

    (2) emitter-junction bias is just equal to collector-junction bias

    (3) no signal is applied to the input

    (4) it is unbiased

7. Compared to CB amplifier, the CE amplifier has   ( )

    (1) higher current amplification

    (2) lower input resistance

    (3) higher output resistance

    (4) lower current amplification

8. The negative output swing starts clipping first when Q-point   ( )

    (1) is near saturation point

    (2) is near cut-off point

    (3) has optimum value

    (4) is in the active region of the load line

9. Introducing a resistor in the emitter of CE amplifier stabilizes the dc operating point against variations in   ( )

    (1) only the β of the transistor

    (2) both temperature and β

    (3) only the temperature

    (4) neither β nor temperature

10. Which of the following class of amplifiers has highest among of distortion ?   ( )

    (1) class C   (2) class AB

    (3) class B   (4) class A

11. Tuned voltage amplifiers are not used   (   )

    (1) in radio receivers

    (2) where a band of frequencies is to be selected and amplified

    (3) in television receivers

    (4) in a public-address systems

12. Feedback in a amplifier always helps to   (   )

    (1) increase its gain

    (2) stabilize its gain

    (3) decrease its input impedance

    (4) control its output

13. An ideal OP-AMP has   (   )

    (1) infinite input resistance and infinite output resistance

    (2) infinite input resistance and zero output resistance

    (3) zero input resistance and infinite output resistance

    (4) zero input resistance and zero output resistance

14. For square wave generation _____ is used.   (   )

    (1) bistable multivibrator

    (2) schmitt trigger

    (3) astable multivibrator

    (4) monostable multivibrator

15. Pulse width of a collector coupled monostable multivibrator is given by   (   )

    (1) $T = 0.69\ RC$

    (2) $T = 0.707\ RC$

    (3) $T = 1.69\ RC$

    (4) $T = 1.38\ RC$

16. In series resonance circuit, increasing inductance to twice its value and reducing capacitance to half its value   (   )

    (1) will change the maximum value of current

    (2) will change the resonance frequency

    (3) will increase the selectivity of the circuit

    (4) will change the impedance at resonance frequency

17. A high Q coil has   (   )

     (1) low losses

     (2) flat response

     (3) high losses

     (4) large bandwidth

18. Superposition theorem is based on the concept of   (   )

     (1) duality   (2) reciprocity

     (3) linearity   (4) non-linearity

19. In the Thevenin equivalent circuit, V_{th} equals   (   )

     (1) short-circuit terminal voltage

     (2) open-circuit terminal voltage

     (3) net voltage available in the circuit

     (4) voltage of the source

20. An independent voltage source in series with an impedance $Z_S = R_S + jX_S$ delivers a maximum average power to a load impedance Z_L when   (   )

     (1) $Z_L = R_S$ (2) $Z_L = jX_S$

     (3) $Z_L = R_S + jX_S$ (4) $Z_L = R_S - jX_S$

21. The minimum standing waves occur where reflection coefficient is   (   )

     (1) zero   (2) unity

     (3) -1 (4) ∞

22. Impedance matching over wider-frequency range can be obtained   (   )

     (1) single stub

     (2) double stub

     (3) quarter wave transformer

     (4) balun

23. A lossless line will be distortionless if the phase shift   (   )

     (1) is constant with frequency

     (2) varies inversely with frequency

     (3) varies directly with frequency

     (4) has nothing to do with distortion on a lossless line

24. Which of the following methods can be used for measuring power without using wattmeter ?   (   )

    (1) one voltmeter, one ammeter

    (2) two voltmeters, two ammeters

    (3) three voltmeters

    (4) three ammeters

25. When large currents are to be measured using DC ammeter, the major part of the current is bypassed through a   (   )

    (1) capacitor   (2) resistor

    (3) inductor   (4) diode

26. The shunt-type ohm meter is suited to the measurement of   (   )

    (1) high-value resistance

    (2) medium-value resistance

    (3) both medium and high-value resistance

    (4) low-value resistance

27. Digital instruments are preferred to other indicating instruments because of   (   )

    (1) narrow bandwidth

    (2) better accuracy

    (3) cost

    (4) better resolution

28. Without a spectrum analyzer, it is not possible to determine   (   )

    (1) modulating frequency

    (2) antenna pattern

    (3) pulse width

    (4) spurious signal strength and its location

29. The Q-meter is used to measure the electrical properties of   (   )

    (1) resistors only

    (2) inductors only

    (3) coils and capacitors

    (4) capacitors only

30. The deflection sensitivity of a CRT depends inversely on the .   ( )

    (1) separation between Y plates

    (2) length of the vertical deflecting plates

    (3) deflecting voltage

    (4) distance between screen and deflecting plates

31. The CRO is used to measure   ( )

    (1) power of the signal

    (2) time period of the signal only

    (3) amplitude and time period of the signal

    (4) spectral components of the signal

32. Audio frequency oscillators, operating roughly in the   ( )

    (1) 0 Hz to 20 Hz

    (2) 1 Hz to 1-MHz

    (3) 1 kHz to 1000 kHz

    (4) 20 Hz to 20 kHz

33. A non-triggered oscilloscope is one which   ( )

    (1) has no sweep generator

    (2) can not produce a stable stationary screen display

    (3) has a continuously running time-base generator

    (4) can display a portion of the input signal waveform

34. After firing an SCR, the gating pulse is removed. The current is the SCR will   ( )

    (1) immediately fall to zero

    (2) rise a little and then fall to zero

    (3) rise up

    (4) remain the same

35. A TRIAC can be triggered into conduction by   ( )

    (1) only positive voltage at either anode

    (2) positive or negative voltage at gate

    (3) positive or negative voltage at gate and positive or negative voltage at either anode

    (4) only negative voltage at either anode

36. An SCR conducts appreciable current when ( )

    (1) anode is negative and gate is positive with respect to cathode

    (2) gate is negative and anode is positive with respect to cathode

    (3) anode and gate are both positive with respect to cathode

    (4) anode and gate both negative with respect to cathode

37. In a thyristor, the ratio of holding current to latching current is ( )

    (1) 0.4

    (2) 2.5

    (3) 1.0

    (4) 4.0

38. In a 3-phase full converter, the output voltage pulsates at a frequency equal to ( )

    (1) supply frequency f

    (2) 3f

    (3) 6f

    (4) 2f

39. In BJT, the relation between α and β is ( )

    (1) $\beta = \dfrac{\alpha}{(\alpha + 1)}$

    (2) $\beta = \dfrac{\alpha}{(\alpha - 1)}$

    (3) $\alpha = \dfrac{\beta}{(\beta + 1)}$

    (4) $\alpha = \dfrac{(\beta + 1)}{\beta}$

40. In three-phase 180^0 mode bridge inverter, the lowest order harmonic in the line to neutral output voltage (fundamental frequency output = 50 Hz) is ( )

    (1) 100 Hz

    (2) 150 Hz

    (3) 250 Hz

    (4) 200 Hz

41. A single phase full bridge diode rectifier delivers a load current of 10A, which is ripple free. Average and RMS values of diode currents are respectively ( )

    (1) 10A, 7.07A

    (2) 5A, 7.07A

    (3) 7.07A, 5A

    (4) 5A, 10A

42. Resonant mode power supplies in comparison to square mode ones   ( )

   (1) have smaller component count

   (2) do not cause over voltages

   (3) have negligible power loss

   (4) slower in control action

43. A delta-connected induction motor being fed by a 3-phase AC to DC inverter and operated in constant V/f control mode requires during starting a   ( )

   (1) star-delta starter

   (2) no starter requires

   (3) auto-transfer starter

   (4) direct online starter

44. The message signal contains three frequencies 2 kHz, 5 kHz and 10 kHz respectively. The bandwidth of the AM signal is   ( )

   (1) 20 kHz   (2) 5 kHz

   (3) 2 kHz   (4) 10 kHz

   B.W = 2 × Highest frequency component

45. A carrier is simultaneously modulated by two sine waves with modulation indices of 0.3 and 0.4; the resultant modulation index is   ( )

   (1) 0.7   (2) 0.4

   (3) 0.3   (4) 0.5

46. Indicate which one of the following is not advantage of FM over AM

   (1) lower bandwidth is required

   (2) better noise immunity is provided

   (3) less modulating power is required

   (4) the transmitted power is more useful

47. In a low-level AM system, amplifiers following the modulated stage must be   ( )

   (1) harmonic devices

   (2) nonlinear devices

   (3) linear devices

   (4) class C amplifier

48. A_c and A_m are peak amplitudes of carrier and modulating signal respectively. When $A_c = A_m$ ( )

(1) modulation index is 100%

(2) modulation index is zero

(3) modulation index falls below 100%

(4) modulation index is above 100%

49. In a SSB transmitter, one is most likely to find a ( )

(1) class C audio amplifier

(2) class A R.F output amplifier

(3) class B R.F. amplifier

(4) tuned modulator

50. A superheterodyne receiver with an I.F. of 450 kHz is tuned to a signal at 1200 kHz. The image frequency is ( )

(1) 750 kHz   (2) 900 kHz

(3) 1650 kHz   (4) 2100 kHz

$$(f_{is} = f_s + 2IF)$$

51. In a radio receiver with simple AGC ( )

(1) an increase in signal strength produces more AGC

(2) the faster the AGC time constant, the more accurate the output

(3) the highest AGC voltage is produced between stations

(4) the audio stage gain is normally controlled by the AGC

52. To prevent overloading of the last I.F. amplifier in a receiver, one should use ( )

(1) double conversion

(2) variable selectivity

(3) variable sensitivity

(4) squelch

53. One of the main functions of R.F. amplifier in a superheterodyne receiver is to ( )

(1) provide improved tracking

(2) improve the rejection of the image frequency

(3) permit better adjacent-channel rejection

(4) increase the tuning range of the receiver

54. Frequencies in the UHF range propagate by means of ( )

    (1) sky waves

    (2) surface waves

    (3) ground waves

    (4) space waves

55. When electromagnetic waves travel in free space only one of the following can happen to the ( )

    (1) attenuation   (2) reflection

    (3) refraction   (4) absorption

56. In PCM system, the quantization noise depends upon ( )

    (1) the sampling rate

    (2) both the sampling rate and the number of quantization levels

    (3) the Nyquist rate

    (4) the number of quantization levels

57. The bit rate of a digital communication system is 36 Mbps, the modulation scheme is QPSK. The baud rate of the system is ( )

    (1) 72 Mbps   (2) 68 Mbps

    (3) 36 Mbps   (4) 18 Mbps

58. Which multiplexing technique transmits analog signal ( )

    (1) FDM   (2) WDM

    (3) TDM   (4) both FDM and TDM

59. The standard reference antenna for the directive gain is the ( )

    (1) half-wave dipole

    (2) isotropic antenna

    (3) infinitesimal dipole

    (4) elementary doublet

60. Yagi antenna contains ( )

    (1) one reflector and one director

    (2) dipole, one reflector and one director

    (3) two directors, no reflector

    (4) dipole and two directors

61. The radiation resistance of a Hertizian dipole _____ with increase in length of dipole ( )

(1) increases

(2) remains unchanged

(3) attains a maximum and then falls

(4) decreases

162. The wavelength of a wave in a waveguide ( )

(1) is directly proportional to the group velocity

(2) is inversely proportional to the phase velocity

(3) is greater than in free space

(4) depends on the wavelength dimensions and the free space wavelength

63. The guide wavelength (λ_g) is related to free space (λ) wavelength and cut-off wavelength (λ_c) as ( )

(1) $\frac{1}{\lambda^2} = \frac{1}{\lambda_c^2} + \frac{1}{\lambda_g^2}$

(2) $\frac{1}{\lambda_g^2} = \frac{1}{\lambda^2} + \frac{1}{\lambda_c^2}$

(3) $\frac{1}{\lambda_c^2} = \frac{1}{\lambda_g^2} + \frac{1}{\lambda^2}$

(4) $\frac{1}{\lambda^2} = \frac{1}{\lambda_c^2} + \frac{1}{\lambda_g^2}$

64. 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) 8 (2) 4

(3) 2 (4) 16

$$\left[R^4 = \frac{P_t G_t A_r \sigma}{(4\pi)^2 S_{min}} \right]$$

65. The biggest disadvantage of CW Doppler radar is that ( )

(1) it does give target range, but not position

(2) it does not give the target position

(3) it does not give the target velocity

(4) it does not give the target range

Radiant's

66. Which of the following system is an international system ( )

    (1) INSAT   (2) ATS-6

    (3) MARISAT   (4) INTELSAT

67. A typical optical fiber has ( )

    (1) high refractive index core and low refractive index cladding

    (2) uniform refractive index core surrounded by variable refractive index cladding

    (3) variable refractive index core with refractive index increasing from low value at the centre of the core to high value at the junction with the cladding

    (4) low refractive index core and high refractive index cladding

68. The GSM standard is ( )

    (1) first generation cellular networks

    (2) second generation cellular networks

    (3) third generation cellular networks

    (4) fourth generation cellular networks

69. The 2's complement of 1000_2 is ( )

    (1) 0111   (2) 0001

    (3) 1000   (4) 0101

70. Which of the following is not an octal number ? ( )

    (1) 19   (2) 101

    (3) 15   (4) 17

71. The complete set of only those logic gates designated as universal gates is ( )

    (1) NOT, OR and AND gates

    (2) XNOR, NOR and NAND gates

    (3) NOR and NAND gates

    (4) XOR, NOR and NAND gates

72. The gates required to build an half-adder are ( )

    (1) Ex-OR gates and NOR gate

    (2) three NAND gates

   (3) EX-OR gate and OR gate

    (4) EX-OR and AND gate

73. Read and write capabilities are available in   (   )

    (1) Both ROM and RAM

    (2) RAM

    (3) ROM

    (4) Latch

74. An n-bit ADC using V_R as reference voltage has a resolution (in volts) of   (   )

    (1) $V_R/2^n$ (2) $V_R.2n$

    (3) $V_R/2^{n-1}$ (4) $V_R.n$

75. In a 4-bit weighted-resistor D/A converter, the resistor value corresponding to LSB is 32 kΩ. The resistor value corresponding to MSB will be   (   )

    (1) 16 kΩ   (2) 8 kΩ

    (3) 4 kΩ   (4) 32 kΩ

$$MSB = \frac{LSB}{2^3}$$

76. The minimum number of NAND gates required to implement the Boolean function $A + A\bar{B} + A\bar{B}C$ is equal to   (   )

    (1) 1   (2) 4

    (3) zero   (4) 7

77. Which of the following ADC is the fastest type of ADC   (   )

    (1) Dual slope integrator ADC

    (2) Flash type of ADC

    (3) Counter type of ADC

    (4) Integrator type of ADC

78. When two n-bit binary numbers are added then the sum will contain at the most   (   )

    (1) (n + 2) bits   (2) n bits

    (3) 2n bits   (4) (n + 1) bits

79. The 8051 microcontroller has   (   )

    (1) one bus   (2) two buses

    (3) three buses   (4) four buses

80. The number of interrupts available in 8051 microcontroller   (   )

    (1) five   (2) six

    (3) eight   (4) three

81. The 8051 is an _____ microcontroller   (   )

    (1) 16 bit   (2) 32 bit

    (3) 64 bit   (4) 8 bit

82. The 8051 microcontroller includes an instruction set of _____ operation codes.   (   )

    (1) 245   (2) 255

    (3) 250   (4) 260

83. The 8051 microcontroller consists of   (   )

    (1) 256 bytes RAM

    (2) 512 bytes RAM

    (3) 128 bytes RAM

    (4) 64 bytes RAM

84. The USART accepts data characters from the CPU   (   )

    (1) in parallel format and then converts them into a continuous serial data stream

    (2) in serial format and then converts them into a parallel format data stream

    (3) in parallel format and after certain delay transmits as a parallel data stream

    (4) in serial format and after certain delay transmits as a serial data stream

85. The peripheral interface controller 8255 has _____ separately accessible ports.   (   )

    (1) three   (2) six

    (3) two   (4) eight

86. The number of operating modes of 8257 DMA controller   (   )

    (1) 4   (2) 6

    (3) 5   (4) 3

87. The number of addressing modes available in 8086 microprocessor   (   )

    (1) 10   (2) 8

    (3) 6   (4) 12

88. The 8086 microprocessor is a

   (1) 8-bit processor

   (2) 16-bit processor

   (3) 32-bit processor

   (4) 64-bit processor

89. A complete television signal consists of

   (1) cameral signal

   (2) sync pulses and a sound signal

   (3) a video signal and sync pulses

   (4) a composite video signal and sound signal

90. Interlacing is used in TV frames to

   (1) avoid flicker

   (2) ensure scanning of all lines

   (3) produce illusion of motion

   (4) ensure scanning of all lines and produce illusion of motion

91. In TV system, equalizing pulses are sent during

   (1) horizontal blanking

   (2) horizontal retrace

   (3) serrations

   (4) vertical blanking

92. In TV signals, the colour burst is used to

   (1) interface each horizontal line

   (2) ensure the I and Q phase correctly

   (3) maintain the colour sequence

   (4) synchronise colours

93. The resolution of a TV picture is determined by

   (1) video bandwidth

   (2) video amplification factor

   (3) the number of frames scanned

   (4) the output of the video detector

94. Altenuation will be more in ( )

    (1) multi mode fibers

    (2) single mode fibers

    (3) multi mode and single mode fibers

    (4) single mode fibers of 8 μm core diameters

95. Star topologies are operated in ( )

    (1) half duplex mode only

    (2) full duplex mode only

    (3) simplex mode only

    (4) half or full duplex mode

96. Datagram switching is done at the ( )

    (1) data link layer   (2) network layer

    (3) transport layer   (4) physical layer

97. Which of the following reduces the probability of collision ( )

    (1) p-persistent

    (2) l-persistent

    (3) non-persistent

    (4) both l-persistent and non-persistent

98. The multiple access technique used in wireless local area network is ( )

    (1) CSMA

    (2) CSMA/CD

    (3) CSMA/CA

    (4) CSMA with l-persistent

99. X.25 is a ( )

    (1) packet switching network

    (2) virtual-circuit switching network

    (3) circuit switching network

    (4) frame relay

100. The ATM standard defines ( )

    (1) five layers   (2) four layers

    (3) three layers   (4) seven layers
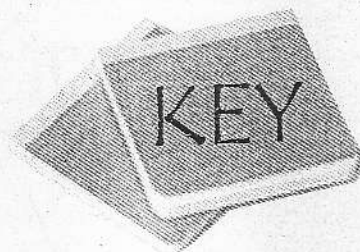
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91. 4	92. 2	93. 3	94. 1	95. 2	96. 2	97. 1	98. 1	99. 1	100. 2