# 96/2014

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Removing bypass capacitor across the emitter-leg resistor in a CE amplifier causes :
   (A) Increase in current gain
   (B) Decrease in current gain
   (C) Increase in voltage gain
   (D) Decrease in voltage gain

2. The breakdown mechanism in a lightly doped p-n junction under reverse biased condition is called :
   (A) Avalanche breakdown
   (B) Zener breakdown.
   (C) Breakdown by tunnelling
   (D) High voltage breakdown

3. BIOS means :
   (A) Binary input/output service
   (B) Basic input/output system
   (C) Basic information of system
   (D) None of these

4. A network configuration in which each computer is attached to a central unit is called a ———— network.
   (A) Star
   (B) Bus
   (C) Hybrid
   (D) None of these

5. In an intrinsic semiconductor, the Fermi-level is :
   (A) Closer to the valence band
   (B) Midway between conduction and valence band
   (C) Closer to the conduction band
   (D) Within the valence band

6. Data is transmitted using light through a ———— cable.
   (A) Twisted pair
   (B) Fiber-optic
   (C) Coaxial
   (D) Microwave

7. An oscillator of the LC type that has a split capacitor in the circuit is :
   (A) Hartley oscillator
   (B) Colpitts oscillator
   (C) Weinbridge oscillator
   (D) R-C phase shift oscillator

8. After the magnetizing force has been removed, the ratio of the remaining magnetic flux to the saturated magnetic flux is called :

(A) Saturation (B) Retentivity

(C) Hysterisis (D) Coercivity

9. The shape of warning sign is :

(A) Triangular (B) Square

(C) Circular (D) Oblong

10. If a voltmeter marked in volts is used to measure a 3500 milli volt potential, what reading would it show?

(A) 3.5 volts (B) 0.35 volt

(C) 35 volts (D) 350 volts

11. In a series resonant circuit at resonance, the circuit has :

(A) low mutual inductance (B) high impedance

(C) low impedance (D) high mutual inductance

12. HDTV stands as :

(A) High Definition Television (B) Half Definition Television

(C) Huge Definition Television (D) None of these

13. A circuit designed to increase the level of its input signal is called :

(A) A receiver (B) A modulator

(C) An oscillator (D) An amplifier

14. In a Yagi-Uda 3 element directional antenna, the ———— is the longest radiating element.

(A) Director (B) Driven element

(C) Reflector (D) None of these

15. The connecting leads in an IC chip are made of :

(A) Aluminium (B) Silicon

(C) Calcium (D) None of these

16. A type of memory chip whose contents can be quickly changed by the computer at any time is called :

(A) VDT (B) RUM

(C) ROM (D) RAM

17. The NAND gate output will be low if the two inputs are :
(A) 0 0 (B) 0 1
(C) 1 0 (D) 1 1

18. A flip-flop has two outputs which are :
(A) Always zero (B) Always one
(C) Always complementary (D) In one of the above states

19. Primary source of power for satellite is :
(A) lead acid battery (B) nickel-cadmium battery
(C) solar cells (D) regulated power supply

20. Which of the following is the fastest logic?
(A) TTL (B) ECL
(C) CMOS (D) LSI

21. How many flip flops are required to construct a decade counter?
(A) 10 (B) 3
(C) 4 (D) 2

22. A universal logic gate is one, which can be used to generate any logic function. Which of the following is a universal logic gate?
(A) OR (B) AND
(C) XOR (D) NAND

23. A full adder logic circuit will have :
(A) Two inputs and one output (B) Three inputs and three outputs
(C) Two inputs and two outputs (D) Three inputs and two outputs

24. The 2's complement of the number 1101110 is :
(A) 0010001 (B) 0010011
(C) 0010010 (D) None of these

25. A watt-hour meter measures :
(A) Energy (B) Current
(C) Voltage (D) Power

26. The Schmitt trigger circuit behaves as a :
(A) Triangular wave generator (B) Mono stable multi vibrator
(C) Bi-stable multi vibrator (D) Free running multi vibrator

27. Satellite communication works through :

(A) Radar
(B) Transponder
(C) Receptor
(D) None of these

28. The fourth color band on a resistor mean :

(A) The value of the resistor in ohms
(B) The power rating in watts
(C) The resistance material
(D) The resistance tolerance in percent

29. MPEG stands as :

(A) Moving Pictures Expert Group
(B) Most Pictures Expert Group
(C) Moving Pictures Enhance Group
(D) None of these

30. In our TV system, which system is being followed?

(A) PAL
(B) NTSC
(C) SECAM
(D) None of these

31. What is a coaxial cable?

(A) Two wires side-by-side in a plastic ribbon
(B) Two wires side-by-side held apart by insulating rods
(C) Two wires twisted around each other in a spiral
(D) A center wire inside an insulating material which is covered by a metal sleeve or shield

32. Wien bridge oscillator can typically generate frequencies in the range of :

(A) 1 KHz – 1 MHz
(B) 1 MHz – 10 MHz
(C) 10 MHz – 100 MHz
(D) 100 MHz – 150 MHz

33. In a full-wave rectifier without filter, the ripple factor is :

(A) 1.21
(B) 0.482
(C) 1.79
(D) 2.05

34. The arrangement of the computers in a network is called the :

(A) NOS
(B) Topology
(C) Node layout
(D) Protocol

35. Which of the following diodes has a negative-resistance region?

(A) Schottky
(B) Varactor
(C) Power
(D) Tunnel

36. N-type silicon is obtained by :
(A) Doping with tetravalent element
(B) Element Doping with trivalent element
(C) Doping with pentavalent
(D) Doping with a mixture of trivalent and tetravalent

37. D-MOSFET can be operated in ———— mode.
(A) saturation
(B) depletion
(C) enhancement
(D) depletion and enhancement

38. What is the phase difference between input and output signal in a CE amplifier?
(A) 0°
(B) 45°
(C) 180°
(D) 90°

39. The voltage gain of CC amplifier is :
(A) Less than 1
(B) Greater than 1
(C) Equal to 1
(D) None of these

40. Which of the following statements is true?
(A) FET and BJT, both are unipolar
(B) FET and BJT, both are bipolar
(C) FET is bipolar and BJT is unipolar
(D) FET is unipolar and BJT is bipolar

41. Which of the following amplifiers is known as an emitter follower?
(A) CE amplifier
(B) CC amplifier
(C) CB amplifier
(D) Cascade amplifier

42. Power is defined as :
(A) The rate at which current flows in a circuit
(B) The rate at which energy is radiated or dissipated
(C) The accumulation of energy over time
(D) The amount of heat generated in a circuit

43. Three equal resistance of magnitude 5 Ohm each are connected in delta. The resistance between any two pair of terminals of the delta will be :
(A) 5 Ohm
(B) 5/3 Ohm
(C) 10/3 Ohm
(D) 3/5 Ohm

44. The other name for beta of BJT is :
(A) Current amplification factor
(B) Voltage amplification factor
(C) Power amplification factor
(D) None of these

45. One coulomb-per second is equal to one :
(A) Watt
(B) Joule
(C) Volt
(D) Ampere

46. The reverse - saturation current of a silicon diode :
(A) Doubles for every 10°C increase in temperature
(B) Does not change with temperature
(C) Halves for every 1°C decrease in temperature
(D) Increases by 1.5 times for every 2°C increment in temperature.

47. In class – A amplifier, the output current flows for :
(A) A part of the cycle or the input signal
(B) The full cycle of the input signal
(C) Half the cycle of the input signal
(D) 3/4th of the cycle of the input signal

48. For silicon the forbidden gap is :
(A) 1.1 ev
(B) 0.25 ev
(C) 0.5ev
(D) 0.7 ev

49. The modulation used in cellular communication is :
(A) Amplitude modulation
(B) Pulse code modulation
(C) Digital modulation
(D) Narrow band frequency modulation

50. Manganin is an alloy of :
(A) Copper, manganese and nickel
(B) Copper and manganese
(C) Manganese and nickel
(D) Manganese, aluminium and nickel

51. In Quadrature Amplitude Modulation, (QAM), the carrier is modulated by :
(A) Amplitude
(B) Phase
(C) Frequency
(D) Both (A) and (B)

52. What are the steps followed to achieve Pulse Code Modulation?
(A) Sampling, quantizing, modulation
(B) Detecting, sampling, quantizing
(C) Sampling, quantizing, coding
(D) Coding, modulating, packetizing

53. An ideal power supply is characterized by :
(A) Very large output resistance
(B) Very small output resistance
(C) Zero internal resistance
(D) Infinite internal resistance

54. What is the "power factor"?

(A) Ratio of true power to apparent power

(B) Peak power times 0.707

(C) Sin of the phase difference between E and I

(D) None of the above

55. A house served by a 220 V supply light, is protected by a 9-Ampere fuse. The maximum number of 60W bulbs in parallel that can be turned on is :

(A) 11 (B) 33

(C) 22 (D) 44

56. Holes are the minority carriers in which type of semiconductor?

(A) Extrinsic (B) Intrinsic

(C) N-type (D) None of the above

57. Doubling the number of turns of wire in an inductor :

(A) Reduces the value of inductance by one-half

(B) Multiplies the value of inductance by two

(C) Reduces the value of inductance by one-fourth

(D) Multiplies the value of inductance by four

58. Which bus is bidirectional?

(A) Data bus (B) Control bus

(C) Address bus (D) Multiplexed bus

59. If the input to a comparator is a sine wave, the output is a :

(A) Ramp voltage (B) Rectangular wave

(C) Sine wave (D) Sawtooth wave

60. Convert the binary number 1011010 to hexadecimal :

(A) 5A (B) 5F

(C) 5B (D) None of the above

61. A half-cycle average voltage of 12 V is equal to what rms voltage?

(A) 13.33 V (B) 8.48 V

(C) 18.84 V (D) 7.64 V

62. ASCII stands for :

(A) American Serial Communication interface

(B) Additive Signal Coupling Interface

(C) American Standard Code for Information Interchange

(D) None of the above

63. How is power dissipated in a resistor?

(A) By voltage (B) By heat

(C) By current (D) None of the above

64. You can determine the direction of the lines of force surrounding a conductor by using :

(A) The left-hand rule (B) The right-hand rule

(C) Lenz's law (D) None of the above

65. Moving iron meter is suitable for measurement of :

(A) AC (B) DC

(C) AC/DC (D) DC/AC with rectifier

66. The effective value of a sine wave is equal to :

(A) 0.707 of peak voltage

(B) 0.636 of peak voltage

(C) Sin 45° of peak voltage

(D) Both 0.707 of peak voltage and sin 45° of peak voltage

67. How is ac current related to ac voltage in a purely capacitive circuit?

(A) AC current is 0.707 of the ac voltage (B) AC current lags ac voltage

(C) AC current is 0.637 of the ac voltage (D) AC current leads ac voltage

68. A basic S-R flip-flop can be constructed by cross-coupling which basic logic gates?

(A) AND or OR gates (B) XOR or XNOR gates

(C) NOR or NAND gates (D) AND or NOR gates

69. A JFET :

(A) Is a voltage-controlled device (B) Has a low input resistance

(C) Is a current-controlled device (D) None of the above

70. When does maximum power transfer happen from the source to the load?

(A) When the source resistance is greater than the load resistance

(B) When the source resistance is less than the load resistance

(C) When there is negligible source resistance

(D) When the source resistance equals the load resistance

71. To connect a computer with a device in the same room, you might be likely to use :

(A) A coaxial cable (B) A dedicated line

(C) All of the above (D) None of the above

72. Frames from one LAN can be transmitted to another LAN via the device :

(A) Router (B) Bridge

(C) Repeater (D) None of the above

73. The geostationary satellite used for communication systems :

(A) Rotates with the earth

(B) Remains stationary relative to the earth

(C) Is positioned over equator

(D) All of the above

74. High frequency transformers sometimes make use of ferrite cores because it has :

(A) High resistance (B) High hysteresis

(C) Low permeability (D) None of the above

75. An emitter follower has :

(A) High input impedance and high output impedance

(B) High input impedance and low output impedance

(C) Low input impedance and high output impedance

(D) Low input impedance and low output impedance

76. To prepare a P type semiconducting material the impurities to be added to silicon are :

(A) Gallium, Arsenic
(B) Gallium, Phosphorous
(C) Arsenic, Antimony
(D) Boron, Gallium

77. The device used for locating open circuits or short circuits in a circuit is :

(A) Ammeter
(B) Voltmeter
(C) Ohm meter
(D) None of the above

78. To increase the input resistance and decrease the output resistance in negative feedback, the type used is :

(A) Voltage Shunt
(B) Current Series
(C) Voltage Series
(D) Current Shunt

79. A register in the microprocessor that keeps track of the answer or results of any arithmetic or logic operation is the :

(A) Stack pointer
(B) Accumulator
(C) Program counter
(D) None of the above

80. The waveform used in X-direction in CRO for deflecting the electron beam from left or right is :

(A) Rectangular
(B) Triangular
(C) Square
(D) Saw tooth

81. The machine which transmits documents/maps/photographs over telephone line :

(A) Fax
(B) Type writer
(C) Teleprinter
(D) None of the above

82. Tesla is a unit of :

(A) Field strength
(B) Inductance
(C) Flux density
(D) None of these

83. The equivalent of 1 micro ampere is :

(A) 10000A
(B) 1000A
(C) One millionth of an ampere
(D) None of the above

84. An affordable technology that uses existing telephone lines to provide high-speed connections is called :

(A) ISDN
(B) DSL
(C) Cable modem
(D) Microwave

85. At resonance, the term bandwidth includes all frequencies that allow what percentage of maximum current to flow?

(A) 50 (B) 62.3

(C) 70.7 (D) 95.3

86. Which of the following is a passive component?

(A) Semi-conductor device (B) Capacitors

(C) Vacuum tube device (D) All of the above

87. The process by which Impurities are added to a pure semi-conductor is :

(A) Doping (B) Drift

(C) Diffusing (D) Mixing

88. An ideal operational amplifier has :

(A) Infinite output impedance (B) Zero input impedance

(C) Infinite bandwidth (D) All of the above

89. A digital-to-analog converter is an application of the :

(A) Scaling adder (B) Voltage-to-current converter

(C) Non inverting amplifier (D) Adjustable bandwidth circuit

90. A portion of the output that provides circuit stabilization is considered to be :

(A) Distortion (B) Negative feedback

(C) Open-loop (D) Positive feedback

91. The ratio between differential gain and common-mode gain is called :

(A) Amplitude (B) Common-mode rejection

(C) Differential-mode rejection (D) None of the above

92. The Schmitt trigger is used for :

(A) Peak detection (B) Filtering

(C) In put noise rejection (D) Pulse shaping

93. What type of application would use an injection laser diode?

(A) A 10BASE-T Ethernet (B) A liquid crystal display

(C) A fiber optic transmission line (D) A good flashlight

94. A transducer's function is to :

(A) Convert energy
(B) Transmit electrical energy
(C) Produce mechanical energy
(D) Prevent current flow

95. Which component is considered to be an "OFF" device?

(A) Transistor
(B) JFET
(C) D-MOSFET
(D) E-MOSFET

96. In a PLL, to obtain lock, the signal frequency must :

(A) Come within the lock range
(B) Be less than the capture frequency
(C) Come within the capture range
(D) Be greater than the capture frequency

97. The U and V colour difference signals have phase difference of :

(A) 60°
(B) 90°
(C) 45°
(D) 180°

98. The sensitivity of oscilloscope is determined by :

(A) Horizontal amplifier
(B) Sweep oscillator
(C) Vertical amplifier
(D) C.R.T

99. The frequency of colour subcarrier is :

(A)
(B)
(C)
(D)

100. The major difference between ground and virtual ground is that virtual ground is only a :

(A) Voltage reference
(B) Current reference
(C) Power reference
(D) None of the above