1. The SiO2 layer in an IC acts as

    (A)   a resistor
    (B)   an insulating layer
    (C)   mechanical output
    (D)   None of the above

2. If the arrow of crystal diode symbol is positive w.r.t. bar, then diode is …………. biased.

    (A)   forward
    (B)   reverse
    (C)   either forward or reverse
    (D)   None of the above

3. For faithful amplification by a transistor circuit, the value of V_{BE} should ………. for a silicon transistor

    (A)   be zero
    (B)   be 0.01 V
    (C)   not fall below 0.7 V
    (D)   be between 0 V and 0.1 V

4. Addition of pentavalent impurity to a semiconductor creates many

    (A)   free electrons
    (B)   holes
    (C)   valence electrons
    (D)   bound electrons

5. The impurity level in an extrinsic semiconductor is about …. of pure semiconductor.

    (A)   10 atoms for 10^8 atoms
    (B)   1 atom for 10^8 atoms
    (C)   1 atom for 10^4 atoms
    (D)   1 atom for 100 atoms

6. A hole and electron in close proximity would tend to

   (A) repel each other
   (B) attract each other
   (C) Have no effect on each other
   (D) None of the above

7. The reverse current in a diode is of the order of

   (A) kA
   (B) mA
   (C) µA
   (D) A

8. The forward voltage drop across a silicon diode is about

   (A) 2.5 V
   (B) 3 V
   (C) 10 V
   (D) 0.7 V

9. A crystal diode is used as

   (A) an amplifier
   (B) a rectifier
   (C) an oscillator
   (D) a voltage regulator

10. A trivalent impurity has …………. valence electrons

   (A) 4
   (B) 5
   (C) 6
   (D) 3

11. When the graph between current through and voltage across a device is a straight line, the device is referred to as

   (A) linear
   (B) active
   (C) nonlinear
   (D) passive

12. When the crystal current diode current is large, the bias is

   (A) forward
   (B) inverse
   (C) poor
   (D) reverse

13. A zener diode is used as

   (A) an amplifier
   (B) a voltage regulator
   (C) a rectifier
   (D) a multivibrator

14. The base of a transistor is …………. loped

   (A) heavily
   (B) moderately
   (C) lightly
   (D) None of the above

15. A transistor is …………… operated device

   (A) current
   (B) voltage
   (C) both voltage and current
   (D) None of the above

16. With a 200 kHz clock frequency, eight bits can be serially entered into a shift register in

   (A) 4 us
   (B) 40 μs
   (C) 500 μs
   (D) 40 ms

17. In a transistor, the base current is about …………. of emitter current

   (A) 25%
   (B) 20%
   (C) 35 %
   (D) 5%

18. The input impedance of a transistor is

   (A) high
   (B) low
   (C) very high
   (D) almost zero

19. The value of α of a transistor is

   (A) more than 1
   (B) less than 1
   (C) 1
   (D) None of the above

20. The gain of an amplifier without feedback is 100 db. If a negative feedback of 3 db is applied, the gain of the amplifier will become

   (A) 5 db
   (B) 300 db
   (C) 103 db
   (D) 97 db

21. If the feedback fraction of an amplifier is 0.01, then voltage gain with negative feedback is approximately

   (A) 500
   (B) 100
   (C) 1000
   (D) 5000

22. The gain of an amplifier with feedback is known as ……….. gain

   (A) resonant
   (B) open loop
   (C) closed loop
   (D) None of the above

23. In an LC circuit, when the capacitor is maximum, the inductor energy is

   (A) minimum
   (B) maximum
   (C) half-way between maximum and minimum
   (D) None of the above

24. An LC oscillator cannot be used to produce ………………. frequencies

   (A) high
   (B) audio
   (C) very low
   (D) very high

25. In a phase shift oscillator, the frequency determining elements are

   (A) L and C
   (B) R, L and C
   (C) R and C
   (D) None of the above

26. What is the true power of a 24V AC parallel RL circuit when R = 45 Ω and $X_L = 1100$ Ω?

   (A) 313.45 W
   (B) 12.8 W
   (C) 44.96 W
   (D) 22.3 W

27. At 100% modulation, the power in each sideband is ………………… of that of carrier

   (A) 50%
   (B) 40%
   (C) 60%
   (D) 25%

28. An ammeter is connected in ……………. with the circuit element whose current we wish to measure

   (A) series
   (B) parallel
   (C) series or parallel
   (D) None of the above

29. A galvanometer in series with a high resistance is called

   (A) an ammeter
   (B) a voltmeter
   (C) a wattmeter
   (D) None of the above

30. If the negative potential on the control grid of CRT is increased, the intensity of spot

    (A) is increased
    (B) is decreased
    (C) remains the same
    (D) None of the above

31. The material used to coat inside the face of CRT is

    (A) carbon
    (B) sulphur
    (C) silicon
    (D) phosphorous

32. The most accurate device for measuring voltage is

    (A) voltmeter
    (B) multimeter
    (C) CRO
    (D) VTVM

33. The doping level in a zener diode is …………. that of a crystal diode

    (A) the same as
    (B) less than
    (C) more than
    (D) None of the above

34. An ideal ammeter has ………… resistance

    (A) low
    (B) infinite
    (C) zero
    (D) high

35. If modulation is 100%, then signal amplitude is ………….. carrier amplitude

   (A) equal to
   (B) greater than
   (C) less than
   (D) None of the above

36. A high Q tuned circuit will permit an amplifier to have high

   (A) fidelity
   (B) frequency range
   (C) sensitivity
   (D) Selectivity

37. In the normal operation of an SCR, anode is ………….. w.r.t. cathode

   (A) at zero potential
   (B) negative
   (C) positive
   (D) None of the above

38. When a crystal diode is used as a rectifier, the most important consideration is

   (A) forward characteristic
   (B) doping level
   (C) reverse characteristic
   (D) PIV rating

39. The V-I characteristics for a TRIAC in the first and third quadrants are essentially
    identical to those of ………………. in its first quadrant

   (A) transistor
   (B) SCR
   (C) UJT
   (D) None of the above

40. A DIAC has …………. terminals

   (A) two
   (B) three
   (C) four
   (D) None of the above

41. A UJT has

    (A) two pn junctions
    (B) one pn junction
    (C) three pn junctions
    (D) None of the above

42. Power electronics essentially deals with control of a.c. power at

    (A) frequencies above 20 kHz
    (B) frequencies above 1000 kHz
    (C) frequencies less than 10 Hz
    (D) 50 Hz frequency

43. When the emitter terminal of a UJT is open, he resistance between the base terminal is generally

    (A) high
    (B) low
    (C) extremely low
    (D) None of the above

44. When a UJT is turned ON, the resistance between emitter terminal and lower base terminal

    (A) remains the same
    (B) is decreased
    (C) is increased
    (D) None of the above

45. Digital circuit can be made by the repeated use of

    (A) OR gates
    (B) NOT gates
    (C) NAND gates
    (D) None of the above

46. The h_{fe} parameter is called … ………….. in CE arrangement with output shorted

    (A) voltage gain
    (B) current gain
    (C) input impedance
    (D) None of the above

47. In Boolean algebra, the bar sign (–) indicates

    (A) OR operation
    (B) AND operation
    (C) NOT operation
    (D) None of the above

48. In differential-mode,

    (A) opposite polarity signals are applied to the inputs
    (B) the gain is one
    (C) the outputs are of different amplitudes
    (D) only one supply voltage is used

49. The common-mode gain is

    (A) very high
    (B) very low
    (C) always unity
    (D) unpredictable

50. With zero volts on both inputs, an OP-amp ideally should have an output

    (A) equal to the positive supply voltage
    (B) equal to the negative supply voltage
    (C) equal to zero
    (D) equal to CMRR

51. A certain OP-amp has bias currents of 50 μA. The input offset current is

    (A) 700 nA
    (B) 99.3 μA
    (C) 49.7 μA
    (D) None of the above

52. The active components in an IC are

    (A) resistors
    (B) capacitors
    (C) transistors and diodes
    (D) None of the above

53. Operational amplifiers use

    (A) linear ICs
    (B) digital ICs
    (C) both linear and digital ICs
    (D) None of the above

54. The 555 timer can be used in which of the following configurations?

    (A) Astable, Monostable
    (B) Monostable, Bistable
    (C) Astable, Toggled
    (D) Bistable, Tristable

55. How do fixed resistors usually fail?

    (A) Slowly over time
    (B) By increasing their value
    (C) By becoming an open circuit
    (D) By increasing their value and becoming an open circuit

56. With Ohm's law, if voltage increases and resistance stays the same

    (A) current remains the same
    (B) power decreases
    (C) current increases
    (D) resistance decreases

57. Which of the following is not Ohm's law?

    (A) V = IR
    (B) I = V/R
    (C) R = IV
    (D) R = V/I

58. In a UJT, the p-type emitter is …………….. doped

    (A) Lightly
    (B) Heavily
    (C) Moderately
    (D) None of the above

59. What happens to current and resistance if the voltage doubles?

    (A) Current doubles and resistance doubles.
    (B) Current doubles and resistance is halved.
    (C) Current remains the same and resistance doubles.
    (D) Current doubles and resistance remains the same.

60. What is the average value of a 12 V peak wave?

    (A) 3.82 V
    (B) 4.24 V
    (C) 7.64 V
    (D) 9.42 V

61. A system has the transfer function $(1-s)/(1+s)$. It is known as a/an

    (A) Low pass system
    (B) High pass system
    (C) All pass system
    (D) None of the above

62. A phase lag compensation will

    (A) improve the relative stability
    (B) increase the speed of response
    (C) increase the band width
    (D) increase the overshoot

63. Which of the following bridges measures the dc resistances?

    (A) Whetstone
    (B) Maxwell bridge
    (C) Hay bridge
    (D) Schering bridge

64. When a rectangular voltage waveform is applied to a capacitor, then the current waveform is

   (A) rectangular
   (B) sinusoidal
   (C) saw tooth
   (D) square

65. A loss less line of characteristic impedance Z_0 is terminated in pure reactance of $-jZ_0$ value. VSWR is

   (A) 10
   (B) 2
   (C) 1
   (D) Infinity

66. If the output of an amplifier is 1 V and 100 mV from the output is fed back to the input, then feedback fraction is

   (A) 10
   (B) 1
   (C) 01
   (D) 15

67. When voltage feedback (negative) is applied to an amplifier, its input impedance

   (A) is decreased
   (B) is increased
   (C) remains the same
   (D) None of the above

68. If a parallel plate capacitor connected to a battery, stores twice as much charge as with air dielectric, the susceptibility of the dielectric material between the capacitor plates is

   (A) 4
   (B) 1
   (C) 0
   (D) 2

69. Emitter follower is used for

   (A) current gain
   (B) impedance matching
   (C) voltage gain
   (D) None of the above

70. The positive clipper is that which removes the ……………….. half cycles of the input voltage.

   (A) negative
   (B) positive
   (C) both positive and negative
   (D) None of the above

71. One would find a clamping circuit in

   (A) receiving antenna
   (B) radio transmitter
   (C) radio receiver
   (D) television receiver

72. A power supply which has voltage regulation of ……….. is unregulated power supply

   (A) 0 %
   (B) 5 %
   (C) 10 %
   (D) 8%

73. When the transistor (CE arrangement) is in the cut off region, the collector current is

   (A) I_{CBO}
   (B) I_{CEO}
   (C) $(\beta + 1) I_{CEO}$
   (D) $IC_{(sat)}$

74. If the input to an integrating circuit is a succession of alternating positive and negative pulses of very short duration, the output will be …………… wave

   (A) rectangular
   (B) triangular
   (C) sine
   (D) square

75. A small concentration of minority carriers is injected into a homogeneous semiconductor crystal at one point. An electric field of 10V/cm is applied across the crystal and this moves the minority carriers a distance of 10cm in 20μ sec. The mobility (in cm^2/volt sec) of the minority carriers is

   (A) 1,000
   (B) 2,000
   (C) 5,000
   (D) 500,000

76. The knee voltage of a crystal diode is approximately equal to ………….

   (A) applied voltage
   (B) breakdown voltage
   (C) forward voltage
   (D) barrier potential

77. In a multivibrator, we have ………. feedback.

   (A) negative
   (B) 100 % positive
   (C) both positive and negative
   (D) None of the above

78. In CE arrangement, the value of input impedance is approximately equal to

   (A) H_{ie}
   (B) H_{oe}
   (C) H_{re}
   (D) None of the above

79. The smallest change in applied stimulus that will indicate detectable change in deflection in an indicating instrument is called

   (A) sensitivity
   (B) accuracy
   (C) resolution
   (D) precision

80. An oscilloscope provides easy measurement of ……… … values

   (A) instantaneous
   (B) rms
   (C) peak to peak
   (D) average

81. A NPN transistor has a beta cut off frequency f_β of a 1 MHz and common-emitter short circuit low-frequency current gain β_0 of 200.Its unity gain frequency f_T and the alpha cut off frequency f_α respectively are

   (A) 200 MHz,201 MHz
   (B) 200 MHz,199MHz
   (C) 199 MHz,200MHz
   (D) 201 MHz,200 MHz

82. Laser light which is monochromatic light is also known as

   (A) chromatic
   (B) coherent light
   (C) photon
   (D) monochromatic

83. An ideal crystal diode is one which behaves as a perfect ………. when forward biased.

   (A) conductor
   (B) insulator
   (C) resistance material
   (D) None of the above

84. A multimode step index fiber has a large core diameter of range

  (A) 100 to 300 µm
  (B) 100 to 300 nm
  (C) 200 to 500 µm
  (D) 200 to 500 nm

85. The internal quantum efficiency of LEDs decreasing ………..with…….….. temperature

  (A) exponentially, decreasing
  (B) exponentially, increasing
  (C) linearly, increasing
  (D) linearly, decreasing

86. Multimode step index fiber has

  (A) large core diameter and large numerical aperture
  (B) large core diameter and small numerical aperture
  (C) small core diameter and large numerical aperture
  (D) small core diameter and small numerical aperture

87. Which statement about a series *RC* circuit is true?

  (A) The capacitor's voltage drop is in phase with the resistor's voltage drop.
  (B) The current leads the source voltage.
  (C) The current lags the source voltage.
  (D) The resistor voltage lags the current.

88. A current ratio of I_C/I_E is usually less than one and is called

  (A) Beta
  (B) Theta
  (C) Alpha
  (D) Omega

89. There are …………… *h* parameters of a transistor

  (A) two
  (B) four
  (C) three
  (D) None of the above

90. A transistor behaves as a linear device for

   (A) small signals only
   (B) large signals only
   (C) both small and large signals
   (D) None of the above

91. If temperature changes, h parameters of a transistor

   (A) may or may not change
   (B) do not change
   (C) also change
   (D) None of the above

92. With the positive probe on an NPN base, an ohmmeter reading between the other transistor terminals should be

   (A) open
   (B) infinite
   (C) low resistance
   (D) high resistance

93. Voltage-divider bias provides

   (A) an unstable Q point
   (B) a stable Q point
   (C) a Q point that easily varies with changes in the transistor's current gain
   (D) a Q point that is stable and easily varies with changes in the transistor's current gain

94. To operate properly, a transistor's base-emitter junction must be forward biased with reverse bias applied to which junction?

   (A) collector-emitter
   (B) base-collector
   (C) base-emitter
   (D) collector-base

95.   If a 3-input NOR gate has eight input possibilities, how many of those possibilities will result in a HIGH output?

(A)   1
(B)   2
(C)   7
(D)   8

96.   A zero-level detector is a

(A)   comparator with a sine-wave output
(B)   comparator with a trip point referenced to zero
(C)   peak detector
(D)   limiter

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

(A)   scaling adder
(B)   voltage-to-current converter
(C)   noninverting amplifier
(D)   adjustable bandwidth circuit

98.   What does a Hall effect sensor sense?

(A)   Temperature
(B)   Moisture
(C)   Magnetic field
(D)   Pressure

99.   Why does the Superposition theorem not applicable to power?

(A)   Because it is proportional to square of current and current is a non-linear function
(B)   Because it is proportional to square of voltage and voltage is a non-linear function
(C)   Both A and B
(D)   None of the above

100. Which operation is likely to get executed or performed by Millman's theorem in terms of converting the voltage or current sources into a single equivalent voltage or current source?

(A) Subtraction
(B) Combination
(C) Differentiation
(D) Integration

101. Which among the following is also regarded as 'Dual of Thevenin's Theorem'?

(A) Norton's Theorem
(B) Superposition Theorem
(C) Millman's Theorem
(D) Maximum Power Transfer Theorem

102. Which of the following theorem is manifestation of the law of conservation of energy?

(A) Tellegens theorem
(B) Reciprocity
(C) Thevenin's theorem
(D) Norton theorem

103. The d.c. resistance of a crystal diode is …………. its a.c. resistance

(A) the same as
(B) more than
(C) less than
(D) None of the above

104. The device that does not have the gate terminal is

(A) TRIAC
(B) FET
(C) SCR
(D) DIAC

105. An impulse response of RL circuit is a

(A) Rising Exponential function
(B) Decaying Exponential function
(C) Step function
(D) Parabolic function

106. If the temperature of a crystal diode increases, then leakage current

   (A) remains the same
   (B) decreases
   (C) increases
   (D) becomes zero

107. How many BCD adders would be required to add the numbers $973_{10} + 39_{10}$?

   (A) 3
   (B) 4
   (C) 5
   (D) 6

108. In an unregulated power supply, if load current increases, the output voltage

   (A) remains the same
   (B) decreases
   (C) increases
   (D) None of the above

109. An ideal regulated power supply is one which has voltage regulation of

   (A) 0%
   (B) 5%
   (C) 10%
   (D) 1%

110. As the junction temperature increases, the voltage breakdown point for Zener mechanism

   (A) increases
   (B) decreases
   (C) remains the same
   (D) None of the above

111. The rupture of co-valent bonds will occur when the electric field is …………

   (A) 100 V/cm
   (B) 6 V/cm
   (C) 1000 V/cm
   (D) More than 10^5 V/cm

112. A 256 x 4 EPROM has

   (A) 8 address pins and 4 data pins
   (B) 8 address pins and 8 data pins
   (C) 4 address pins and 8 data pins
   (D) 4 address pins and 4 data pins

113. In a Zener voltage regulator, the changes in load current produce changes in

   (A) Zener current
   (B) Zener voltage
   (C) Zener voltage as well as Zener current
   (D) None of the above

114. The maximum efficiency of full wave rectification is

   (A) 40.6%
   (B) 100%
   (C) 81.2%
   (D) 85.6%

115. When transistors are used in digital circuits they usually operate in the

   (A) active region
   (B) breakdown region
   (C) saturation and cut off regions
   (D) linear region

116. A MOS transistor

   (A) has only one pn junction
   (B) conducts only sufficient voltage if applied to the gate electrode
   (C) has only two electrodes
   (D) has gate electrode in direct contact with the silicon

117. In 8-bit microcomputer having 8 K bytes of RAM memory the length of the SP will be

   (A) 5
   (B) 8
   (C) 11
   (D) 13

118. When we use RRC instruction once in 8085, the number is

    (A) Multiplied by 2
    (B) Divided by 2
    (C) Multiplied by 4
    (D) Divided by 4

119. The single instruction to clear lower four bits of the accumulator in 8025 assembly level language is

    (A) XRI OHF
    (B) ANI FOH
    (C) XRI FOH
    (D) ANI OFH

120. Which of the following is not a vectored interrupt?

    (A) TRAP
    (B) INTR
    (C) RST 7.5
    (D) RST 3

121. In a microprocessor the register which holds the address of next instruction to be fetched is

    (A) Accumulator
    (B) PC
    (C) Stack pointer
    (D) Instruction register

122. How many pins do 8085 microprocessors have?

    (A) 24
    (B) 30
    (C) 40
    (D) 48

123. Which of the following translator program converts assembly language program to object program?

    (A)   Assembler
    (B)   Compiler
    (C)   Macro processor
    (D)   Linker

124. The instruction of high level language is

    (A)   Deferred instruction
    (B)   Micro instruction
    (C)   Macro instruction
    (D)   Mnemonics instructions

125. Which of the following is the procedure for organizing logical steps in solving the problems?

    (A)   Flow chart
    (B)   Algorithm
    (C)   Logic
    (D)   None of the above

126. The register whose content may be added to or subtract from the operant address prior to or during execution of an instruction is known as

    (A)   index register
    (B)   control register
    (C)   address register
    (D)   None of the above

127. For the dominant mode in rectangular wave guide with breadth 10 cm the guide wavelength for a signal of 2.5 GHz will be

    (A)   12cm
    (B)   15cm
    (C)   18cm
    (D)   20cm

128. In circular wave guide with radius r the dominant mode is

   (A) TM_{01}
   (B) TE_{01}
   (C) TM_{11}
   (D) TE_{11}

129. Time-Division Multiplex

   (A) can be used with PAM only
   (B) combines five groups into a super group
   (C) stacks 24 channels in adjacent frequency slots
   (D) interleaves pulses in time domain belonging to different transmissions

130. Quantization means conversion of

   (A) continuous time to discrete time
   (B) continuous amplitude to discrete amplitude
   (C) continuous amplitude to discrete time
   (D) discrete amplitude to continuous amplitude

131. Point out the mismatch among the following modulation techniques.

   (A) PCM
   (B) Delta
   (C) Adaptive Delta
   (D) FM

132. 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) 55 KHz
   (B) 1110 KHz
   (C) 2110 KHz
   (D) 4220 KHz

133. Disturbance from adjacent power line is known as

   (A) crosstalk
   (B) crossfire
   (C) inductive disturbance
   (D) None of the above

134. Capture effect is the characteristics of

   (A) AM
   (B) FM
   (C) PCM
   (D) FDM

135. Frequency in UHF range is propagated by means of

   (A) ground wave
   (B) space wave
   (C) sky wave
   (D) surface wave

136. The leakage current in a crystal diode is due to

   (A) minority carriers
   (B) majority carriers
   (C) junction capacitance
   (D) None of the above

137. The communication mode that supports data in both directions at same time

   (A) Simplex
   (B) Half duplex
   (C) Full duplex
   (D) Multiplex

138. The minimum value of anode current below which it must fall to completely turn-off the device is called as the

   (A) holding current value
   (B) latching current value
   (C) switching current value
   (D) peak anode current value

139. What type of register would shift a complete binary number in one bit at a time and shift all the stored bits out one bit at a time?

   (A) PIPO
   (B) SISO
   (C) SIPO
   (D) PISO

140. Convert the decimal number 151.75 to binary

   (A) 10000111.11
   (B) 11010011.01
   (C) 00111100.00
   (D) 10010111.11

141. An 8-ohm resistor is in series with a lamp. The circuit current is 1 A. With 20 V applied, what voltage is being allowed for the lamp?

   (A) 4 V
   (B) 8 V
   (C) 12 V
   (D) 20 V

142. The number of bits used to store a BCD digit is

   (A) 8
   (B) 4
   (C) 2
   (D) 1

143. Which operator is having right to left associativity in the following?

   (A) Array subscripting
   (B) Function call
   (C) Addition and subtraction
   (D) Type cast

144. Which operator is having the highest precedence?

   (A) Postfix
   (B) Unary
   (C) Shift
   (D) Equality

145. Decimal equivalent of the hexadecimal number E5

(A) 229
(B) 279
(C) 427
(D) 3000

146. What is the output of this program?

```cpp
#include <iostream>
using namespace std;
int main()
{
    int a;
    a = 5 + 3 * 5;
    cout << a
    return 0;
}
```

(A) 35
(B) 20
(C) 25
(D) 30

147. Evaluate the following
(false && true) || false || true

(A) 0
(B) 1
(C) False
(D) None of the above

148. If a signal passing through a gate is inhibited by sending a LOW into one of the inputs, and the output is HIGH, the gate is a(n):

(A) AND
(B) NAND
(C) NOR
(D) OR

149. Increasing the number of turns of wire on the secondary of a transformer will

    (A)   increase the secondary current
    (B)   decrease the secondary current
    (C)   have no effect on the secondary current
    (D)   increase the primary current

150. Mutual induction is dependent on

    (A)   winding ratios
    (B)   output polarities
    (C)   dc voltage levels
    (D)   current changes