1. If 15-A fuse is blown frequently on a house lighting circuit
   (a) Insert a fuse of higher rating
   (b) Insert a fuse of higher voltage rating
   (c) Check line voltage
   (d) Check load and condition of the equipment

2. The temperature coefficient of an extrinsic semiconductor is
   (a) Positive   (b) Negative
   (c) Zero   (d) Unknown

3. If power factor of a circuit is unity, its reactive power is
   (a) A maximum
   (b) Equal to I^2R
   (c) Zero
   (d) A negative quantity

   $P = I^2R.$

4. The temperature coefficient of an intrinsic semiconductor is
   (a) Positive
   (b) Negative
   (c) Zero
   (d) Like that of metals

5. The ability of a radio receiver to discriminate between different input signals and to accept only one definite signal is called its
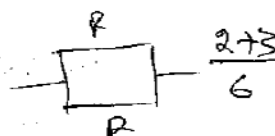   (a) Sensitivity
   (b) Attenuation
   (c) Selectivity
   (d) Modulation

   $\frac{1}{T} = \frac{2}{R}$

   $\frac{1}{T} = \frac{1}{R_1} + \frac{1}{R_1}$

   $\frac{2+3}{6}$

6. The combined resistance of two equal resistors connected in parallel is equal to ——— the resistance of one of the resistor.
   (a) One-half   (b) Twice
   (c) Four times   (d) One fourth

   $\frac{1}{3} + \frac{1}{2}$

   $\frac{5}{6}$

   $\frac{3}{4}$

   $4) \left(\frac{4}{3}\right)$

7. The power factor of a purely resistive network is
   (a) Zero   (b) Unity
   (c) Lagging   (d) Leading

   $\frac{5}{4}$

   $\frac{1+3}{3} = \frac{4}{3}$

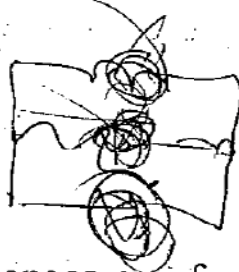8. Which of the following is the poorest conductor of electricity ?
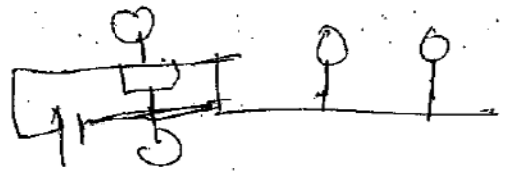   (a) Aluminium
   (b) Copper
   (c) Iron
   (d) Carbon

   $\left(\frac{7}{8}\right)$

CAT 2   (3-X2)

9. A device that changes one form of energy to another is called

    (a) Rheostat

    (b) Oscillator

    (c) Transducer

    (d) Varicap

10. When a low resistance is connected in parallel with a high resistance, the combined resistance is

    (a) Always more than the high resistance

    (b) Always less than the low resistance

    (c) Always between the value of high and low resistance

    (d) Either lower or higher than the low resistance depending on the value of high resistance

11. The instrument often used for checking the degree of motor shaft misalignment is

    (a) A voltmeter

    (b) A clamp-on ammeter

    (c) Dial indicator

    (d) Megoh meter

12. In parallel circuit, all components must

    (a) Have same potential difference across them

    (b) Have the same value

    (c) Carry the same current

    (d) Be switched on or off simultaneously

13. Which of the following electrical equipment cannot convert a.c. into d.c ?

    (a) Diode

    (b) Converter

    (c) Transformer

    (d) Mercury-arc rectifier

14. Which of the material possesses least resistivity ?

    (a) Iron

    (b) Copper

    (c) Silver

    (d) Polythene

15. Which of the following instrument has the lowest resistance ?

    (a) Meggar

    (b) Frequency meter

    (c) Voltmeter

    (d) Ammeter

CAT 2
(5–V2)

16. The material used for <u>fuse</u> must have

   (a) Low melting point and low specific resistance ✓

   (b) Low melting point and high specific resistance ✗

   (c) High melting point and low specific resistance

   (d) High melting point and high specific resistance

17. For measuring <u>voltage</u> across an electrical load, you would connect a / an

   (a) Ammeter across the load

   (b) Voltmeter in series with the load

   (c) Ammeter in series with the load

   (d) Voltmeter across the load

18. A wire connected directly across battery terminals acts as a

   (a) Short circuit

   (b) Medium resistance

   (c) Normal resistance

   (d) High resistance

19. The <u>insulation resistance</u> of a <u>transformer</u> can be easily measured with

   (a) Wheatstone bridge

   (b) Meggar ✓

   (c) Kelvin bridge

   (d) Voltmeter

20. Which of the following stays the <u>same</u> in all parts of a <u>series circuit</u> ?

   (a) Voltage

   (b) Power

   (c) Resistance

   (d) Current

21. A moving coil instrument can be used to measure

   (a) Low frequency a.c

   (b) High frequency a.c

   (c) Direct current

   (d) D.c. and a.c. both

22. The resistance of the windings of a generator is known as

   (a) Generated resistance

   (b) Field resistance

   (c) <u>Internal resistance</u>

   (d) Terminal resistance

23. High battery voltage can be obtained by
    (a) Connecting cells in series
    (b) Connecting cells in parallel
    (c) Using large size cells
    (d) Increasing quantity of electrolyte

24. The most stable sine wave oscillator with most simple circuit is
    (a) Colpitt's
    (b) Armstrong
    (c) Phase shift circuit
    (d) Crystal

25. If a machine is lubricated with oil, then
    (a) Mechanical efficiency of machine increases
    (b) The mechanical advantage of the machine increases
    (c) Both its mechanical advantages and efficiency increase
    (d) Its efficiency increases but its mechanical advantages decreases

26. The main function of electron gun in a cathode ray tube is to —— electrons.
    (a) Deflect
    (b) Produce
    (c) Accelerate
    (d) Focus

27. A certain 3-input logic gate has its three inputs: X=1, Y = 0 and Z = 0. If its output W = 1, the gate is
    (a) NAND only
    (b) AND
    (c) Either NAND or OR
    (d) OR only

28. The digital system usually operates on ————— system.
    (a) Binary
    (b) Decimal
    (c) Octal
    (d) Hexadecimal

29. The decimal equivalent of a hexa - decimal number E 5 is
    (a) 279
    (b) 229
    (c) 327
    (d) 429

30. The binary system uses powers of ——— for positional values.
    (a) 2
    (b) 10
    (c) 8
    (d) 16

31. The sum of binary numbers $(11111)_2$ and $(00001)_2$ is given by
    (a) 100100
    (b) 100000
    (c) 100001
    (d) 100010

32. After counting 0, 1, 10, 11, the next number is
    (a) 12   (b) 100
    (c) 101   (d) 110

33. A 4 bit data word is called
    (a) Byte
    (b) Nybble
    (c) Data bus
    (d) Baud

34. The number 1000_2 is equivalent to decimal number
    (a) One thousand
    (b) Eight
    (c) Four
    (d) Sixteen

35. The main drawback of a feedback system is
    (a) Inaccuracy
    (b) Inefficiency
    (c) Insensitivity
    (d) Instability

36. The cumulative addition of the four binary bits (1+1+1+1) gives
    (a) 1111
    (b) 111
    (c) 100
    (d) 1001

37. Poles are complex frequencies of a transfer function where the response becomes
    (a) Infinite
    (b) Zero
    (c) Oscillatory
    (d) Decaying

38. The result of binary subtraction $(100 - 011)$ is
    (a) –111
    (b) 111
    (c) 011
    (d) 001

39. Which of the following is a closed loop system ?
    (a) Electric switch
    (b) Car starter
    (c) DC generator
    (d) Auto-pilot of an aircraft

CAT 2   (11–V2)

40. The number 12_8 is equivalent to decimal

    (a) 12
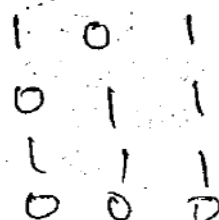
    (b) 20

    (c) 10

    (d) 04

41. In force- current analogy, mass is analogous to

    (a) Inductance

    (b) Current

    (c) Voltage

    (d) Capacitance

42. The output of a 2- input OR gate is 0 only when it's

    (a) Both inputs are zero

    (b) Either input is one

    (c) Both inputs are one

    (d) Either input is zero

43. In a critically damped system, the damping factor of the system is

    (a) Zero

    (b) Unity

    (c) Less than unity

    (d) Greater than unity

44. An XOR gate produces an output only when its two input's are

    (a) High

    (b) Low

    (c) Different

    (d) Same

45. The transfer function of a system is defined as

    (a) Fourier transform of impulse response

    (b) Laplace transform of impulse response

    (c) Fourier transform of unit step response

    (d) Laplace transform of unit step response

46. A NOR gate is ON only when all its inputs are

    (a) ON

    (b) Positive

    (c) High

    (d) Off

47. In diesel engines ignition takes place by

    (a) Dynamo

    (b) Electrical spark

    (c) Compression

    (d) Battery

CAT 2 (13–V2)

48. In a second order system if damping factor ξ is less than unity, the system will be

 (a) Under damped

 (b) Critically damped

 (c) Over damped

 (d) Freely oscillating

49. If $\sqrt{1296} = x^2$, then x =

 (a) 1296

 (b) 6

 (c) 36

 (d) 625

50. In a type-1 system the steady state acceleration error is

 (a) Infinity

 (b) Unity

 (c) Zero

 (d) Not known

51. The average weight of A, B, C is 45 kg. If the average weight of A and B is 40 kg and that of B and C is 43 kg then the weight of B is

 (a) 17 kg

 (b) 20 kg

 (c) 26 kg

 (d) 31 kg

52. For 2% tolerance band, the settling time of the second order linear system with τ as the time constant is

 (a) τ/2

 (b) τ

 (c) 2τ

 (d) 4τ

53. 16% of a number is 216. What is 27% of that number?

 (a) 364.5

 (b) 234.6

 (c) 236.6

 (d) 246.5

54. The starting points of the root loci are

 (a) Open loop poles

 (b) Closed loop poles

 (c) Open loop zeros

 (d) Closed loop zeros

55. The age of a man 10 years ago was thrice the age of his son. Ten years hence, the man's age will be twice that of his son. The ratio of their present ages is

 (a) 7 : 3

 (b) 5 : 2

 (c) 9 : 2

 (d) 13 : 4

56. In root locus plot, increase in k will

 (a) Decrease the damping ratio

 (b) Increase the damping ratio

 (c) Not alter the damping ratio

 (d) May increase or decrease the damping ratio

57. A and B can finish a piece of work in 30 days. They worked at it for 20 days and then B left. The remaining work was done by A alone in 20 more days. A alone can finish the work in

 (a) 48 days

 (b) 50 days

 (c) 54 days

 (d) 60 days

58. Match **List – I** with **List – II** and select the correct answer by using the codes given below the lists :

List – I	List – II
(A) Vitamin	1) Pepsin
(B) Enzyme	2) Carotene
(C) Hormone	3) Keratin
(D) Protein	4) Progesterone

Codes :

	A	B	C	D
(a)	1	2	④	3. ✓
(b)	2	1	3	4
(c)	2	1	④	3
(d)	1	2	3	4

59. A car travels from Bangalore to Mysore at 40 km/h and returns at 60 km/h. What is the average speed for the entire journey ?

(a) 46.87 km/h

(b) 50 km/h

(c) 48 km/h

(d) Cannot be determined with the given data

60. "Mach Number" is a term associated with the speed of

(a) Light

(b) Aeroplanes

(c) Cricket ball

(d) Cars in a race

61. A box kept in a dark room contains 6 green socks, 8 brown socks, 4 black socks and 5 white socks. What is the minimum number of socks to be picked up in the dark room so that one can be sure of having at least one pair to wear ?

(a) 12

(b) 5

(c) 8

(d) 7

62. The original name of Mahabharata was

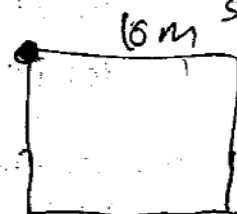(a) Brihath Katha

(b) Ashtadhyaya Tarangini

(c) Jayasamhita

(d) Bhagavad Samhita

63. What is the probability of having 53 Sundays in a leap year ?

(a) 42.3%

(b) 6/7

(c) 51/365

(d) 2/7

64. Apart from Tamil Nadu, lignite is found at

(a) Gujarat

(b) Uttar Pradesh

(c) West Bengal

(d) Orissa

65. A cow is tethered to one corner of a square meadow of side 16 m. The length of the rope is 14 m. What is the area in 'sq m' that can be grazed by the cow and what is the area that cannot be ?

(a) 16π and 14π

(b) $12\pi^2$ and $10\pi^2$

(c) 154 and 102

(d) 66 and 190

66. Archipelagos are

   (a) TIN (Triangulated Irregular Network)

   (b) Icebergs

   (c) A sea containing a group of islands

   (d) Rapid flow of snow down a slope

67. A solid cube is painted red on two adjacent faces, green on the faces opposite to the faces painted red and black on the remaining faces. The cube is then cut into two parts through the centre without touching the black face. One part is cut into 32 smaller identical cubes and the other part is cut into 4 smaller identical cubes. How many smaller cubes have atleast one green face ?

   (a) 14   (b) 20

   (c) 17   (d) 16

68. In a factory 'A's salary was increased by 10% and decreased by 10% while 'B's salary was decreased by 10% and then increased by 10%. The net result was

   (a) A lost and B gained by 10%

   (b) Both have gained by 10%

   (c) No loss, no gain for both

   (d) Both have lost by 1%

69. Find the ratio in which dal of Rs. 72/kg has to be mixed with that of Rs. 57/kg to produce a mixture of Rs. 63/kg

   (a) 1 : 5   (b) 2 : 5

   (c) 1 : 3   (d) 2 : 3

70. $\dfrac{716 \times 716 \times 716 - 16 \times 16 \times 16}{716 \times 716 + 716 \times 16 + 16 \times 16} =$

   (a) 716   (b) 16

   (c) 700   (d) 732

71. A diode with a PIV of 50 V is likely to break down when rectifying 50 V a.c. supply because

   (a) It is made of defective material

   (b) It is incorrectly connected to the supply

   (c) Peak value of the supply exceeds PIV value

   (d) AC supply is of extremely high frequency

72. If two stages of a cascaded amplifier have decibel gains of 60 and 30 then over all gain is —— dB.

   (a) 90

   (b) 1800

   (c) 2

   (d) 0.5

CAT 2   (19–V2)

73. The peak inverse voltage (PIV) is applied across a diode when it is

    (a) ON

    (b) On a heat sink

    (c) Reverse-biased

    (d) Forward-biased

74. Load impedance must match amplifier impedance in order that

    (a) Minimum power is transferred to the load

    (b) Maximum power is transferred to the load

    (c) Efficiency may be held at high level

    (d) Signal-to-noise ratio is maximized

75. The resistance of reverse biased ideal diode is

    (a) Zero

    (b) Low

    (c) Negative

    (d) Infinite

76. Which of the following class of amplifiers has highest amount of distortion ?

    (a) Class-A

    (b) Class-B

    (c) Class-AB

    (d) Class-C

77. In a P-type semiconductor, free electrons

    (a) Form majority carriers

    (b) Take no part in conduction

    (c) Equal the number of holes

    (d) Form minority carriers

78. The signal / noise (S/N) ratio of an amplifier developing an output voltage of 10 V and a noise of 1 mV is —— dB.

    (a) 40

    (b) 100

    (c) – 40

    (d) 80

CAT 2

(21–V2)

79. When used in a circuit, a zener diode is always

 (a) Forward-biased

 (b) Connected in series

 (c) Troubled by over heating

 (d) Reverse-biased

80. The power gain of an amplifier is 80 dB. The half power frequencies f_1 and f_2 are the frequencies where the gain has fallen to ——————— dB.

 (a) 40

 (b) 77

 (c) 0

 (d) $80/\sqrt{2}$

81. In the normal operation of a PNP transistor, its junctions are

 (a) Both forward

 (b) Both reverse

 (c) Emitter-base reverse : collector- base forward

 (d) Emitter-base forward : collector- base reverse

82. In an ideal Op-Amp, the input impedance is

 (a) Infinite

 (b) Zero

 (c) 50 Ohms

 (d) 1 Ohm

83. A PNP transistor has

 (a) Only donor ions

 (b) Only acceptor ions

 (c) Two P- regions and one N- region

 (d) Three PN junctions

84. A field effect transistor (FET) operates on

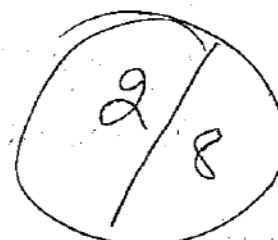 (a) Majority carriers only

 (b) Minority carriers only

 (c) Positively charged ions only

 (d) Negatively charged ions only

85. The effective β of a darlington pair using transistors of β values of 50 and 100 is

 (a) 5000

 (b) 150

 (c) 33.3

 (d) 2

86. Which semi-conductor device operates like a diode and two resistors ?

 (a) SCR

 (b) Triac

 (c) Diac

 (d) UJT

87. A transistor is in active region when

(a) $I_B = \beta I_C$

(b) $I_C = \beta I_B$

(c) $I_C = I_E$

(d) $I_C = I_B$

88. Which semiconductor behaves like two SCRs ?

(a) UJT

(b) Triac

(c) JFET

(d) MOSFET

89. A CE amplifier is characterised by

(a) Low voltage gain

(b) Moderate power gain

(c) Signal phase reversal

(d) Very high output gain

90. An electronic oscillator is

(a) Just like an alternator

(b) Nothing but an amplifier

(c) An amplifier with feedback

(d) A converter of ac to dc energy

91. The overall efficiency of a transformer-coupled class-A amplifier is ____ percent

(a) 78.5

(b) 25

(c) 50

(d) 85

92. An oscillator produces oscillations due to

(a) Positive feedback

(b) Negative feedback

(c) Partly negative and partly positive feedback

(d) Neither positive nor negative feedback

93. The combined dB gain of a two cascaded voltage amplifier whose individual voltage gains are 10 and 100 is

(a) 40

(b) 60

(c) 800

(d) 1000

94. When output power of a radio receiver increases by 3 dB, its absolute power changes by a factor of

(a) 2

(b) 20

(c) 3

(d) 10

CAT 2

(25–V2)

ಸೂಚನೆ : ಕೆಳಗಿನ ವಾಕ್ಯದಲ್ಲಿ ದೋಷವಿರುವ ಭಾಗವನ್ನು ಗುರುತಿಸಿ, ವಾಕ್ಯದೋಷವಿಲ್ಲದಿದ್ದರೆ 'ತಪ್ಪಿಲ್ಲ' ಎಂದು (d) ಭಾಗವನ್ನು ಗುರುತಿಸಿ.

95. 'ಏ' ಇದು <u>ಸಂಬೋಧನಾ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯವಾಗಿದೆ. ತಪ್ಪಿಲ್ಲ</u>
    (a)   (b)   (c)   (d)

ಸೂಚನೆ : ಕೆಳಗೆ ಕೊಟ್ಟ ಶಬ್ದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕವಾದ ಶಬ್ದವನ್ನು ಗುರುತಿಸಿ.

96. ಸಂಕುಚಿತ

    (a) ವಿಕಸಿತ   (b) ಸೀಮಿತ

    (c) ವಿಚಲಿತ   (d) ವಿಚ್ಛೇದಿತ

ಸೂಚನೆ : ಕೆಳಗಿನ ವಾಕ್ಯದಲ್ಲಿ ಪದಗಳು ಕ್ರಮಬದ್ಧವಾಗಿಲ್ಲ. ಅವು ಅರ್ಥಪೂರ್ಣವಾಗುವಂತೆ ಗೆರೆಹಾಕಿ ಸೂಚಿಸಿದ ಭಾಗಗಳನ್ನು ಪುನಃ ಜೋಡಿಸಿ, ಅವುಗಳ ಅನುಕ್ರಮವನ್ನು ಗುರುತಿಸಿ.

97. <u>ಸಿರಿವಂತವಾಗಿದೆ ತಂತ್ರಜ್ಞಾನ ಮನುಕುಲ ಬಳಕೆಯಿಂದ</u>
       P   Q   R   S

    (a) QRPS   (b) RQPS

    (c) QSRP   (d) SRQP

98. The doctor advised the patient <u>to stop</u> smoking. The words 'to stop' can be replaced by the phrasal verb

    (a) Give up   (b) Give away

    (c) Give into   (d) Give over

99. The teachers always encourage us. The passive form of this sentence is

    (a) We will always be encouraged the teachers

    (b) We are always encourage by the teachers

    (c) We were always encouraged by the teachers

    (d) We are always encouraged by the teachers

100. no certainly not said Anand. The sentence can be correctly <u>punctuated</u> as

    (a) No, certainly not. said Anand.

    (b) "No, certainly not," said Anand

    (c) "No. certainly not," said Anand

    (d) "No! certainly not". said Anand

CAT 2   (26-V2)