[SET-III]

GROUP: ELECTRICAL, ELECTRONICS & COMPUTER

Marks: 150 **Time:** 2:30 hours

NOTE:

(i) Attempt all questions. Each question carries **ONE** mark. There will be negative marking. Every wrong answer will result in deduction of **1/4 marks.**

(ii) **There are 150 questions in this booklet.** Against each question four alternative choices (A), (B), (C) and (D) are given, out of which only one is correct. Indicate your choice of answer by Darkening the suitable circle with **Black/Blue Ball Pen** in the OMR answer sheet supplied to you separately.

[ENGLISH/GK/MENTAL APTITUDE]

1. **Find the smallest number which when divided by 25, 40 and 56 has in each case 13 as a remainder.**
   (A) 1413
   (B) 1400
   (C) 1439
   (D) 1426

2. **The audible range of sound is:**
   (A) 20 Hz to 20 MHz
   (B) 20 Hz to 20 kHz
   (C) 20 kHz to 20 MHz
   (D) 20 Hz to 2000 Hz

3. **The branch of science dealing with the improvement of human race is :**
   (A) Genealogy
   (B) Eugenics
   (C) Euphenics
   (D) Cloning

4. **Select the odd from the group of letters:**
   (A) IOU
   (B) AEI
   (C) OUG
   (D) EOI

5. **Which of the following capital of the country is all set to become the world's first city to have 5G NETWORK by 2018?**
   (A) Russia
   (B) Spain
   (C) Canada
   (D) Sweden

6. **Which of the following has won the India's first ever auction of a gold mine?**
   (A) Vedanta Ltd.
   (B) Anglo American
   (C) BHP Billiton
   (D) Rio Tinto

7. **Speak Up! I can't hear you because your dog ..... too much noise.**
   (A) has made
   (B) makes
   (C) is making
   (D) made

8. **Humans ..... apply knowledge of genetics in prehistory with the domestication and breeding of plants and animals.**
   (A) are beginning
   (B) began
   (C) will begin
   (D) begin

9. **Who among the following pioneered Khilafat Movement?**
   (A) Mahatama Gandhi
   (B) M.A. Jinnah
   (C) Sir Syed Ahmed Khan
   (D) Ali Brothers

10. **The birth and death years of Dr. B. R. Ambedkar are:**
    (A) 1889, 1961
    (B) 1886, 1951
    (C) 1877, 1961
    (D) 1891, 1956

11. Who proposed the Preamble before the drafting committee of the constitution?
(A) Jawahar Lal Nehru
(B) B.R. Ambedkar
(C) B.N. Rao
(D) Mahatama Gandhi

12. Indian Economy is:
(A) Capitalistic Economy
(B) Free Economy
(C) Mixed Economy
(D) Socialistic Economy

13. At one's wit's end
(A) Clear up
(B) Explain
(C) Enlighten
(D) Perplexed

14. Black and Blue
(A) To put things in order
(B) To beat very badly
(C) To put things in disorder
(D) To trust someone

15. Rahul said to me , " we are mortal".
(A) Rahul said to me that we are mortal.
(B) Rahul said to me that we all are mortal.
(C) Rahul said to me that he and I are mortal.
(D) Rahul says to me that we are mortal.

16. I said to her, " Could you please help me?"
(A) I requested her to help me.
(B) I asked her to help me.
(C) I told her if she can help.
(D) I asked her if she can help.

17. Delhi became the capital of India in:
(A) 1913
(B) 1916
(C) 1911
(D) 1917

18. Goa was captured by Portugese in:
(A) 1479 AD
(B) 1600 AD
(C) 1575 AD
(D) 1510 AD

19 ..... studies ancient societies.
(A) Anthropology
(B) History
(C) Archaeology
(D) Ethnology

20. I am a .....
(A) Working hard
(B) Hard worker
(C) Hardly working
(D) Works harder

[CHEMISTRY]

21. If N_A is Avogadro number then number of valance electrons in 4.2 gm .og nitride ions (N^{3-}) is
(A) 4.2 N_A
(B) 2.4 N_A
(C) 1.6 N_A
(D) 3.2 N_A

22. 60 gm of organic compound on analysis gave the following results: C = 24 gm; H = 4 gm and O = 32 gm. The empirical formula of the compound is
(A) CH_2O
(B) CHO
(C) C_2H_2O
(D) $C_2H_2O_2$

23. The following equation is a completely balanced equation:

$$2Sn + 12HCl + 4HNO_3 \longrightarrow 3SnCl_4 + 8H_2O + 4NO$$

In the above reaction, number of equivalents per formula weight of HNO_3 is
(A) 3
(B) 4
(C) 1
(D) 2

24. The oxidation state of S in $H_2S_2O_8$ is
(A) +10
(B) +8
(C) +6
(D) +4

25. Aufbau principle does not give correct arrangement of filling up of atomic orbitals in
(A) Cu and Zn
(B) Co and Zn
(C) Mn and Cr
(D) Cu and Cr

26. The experimental value of dipole moment of HCl is 1.03 D. The length of H-Cl bond is 1.275 Å. The percentage of ionic character in H-Cl is
(A) 7
(B) 17
(C) 43
(D) 21

27. Which of the following statement about covalent bond is NOT TRUE?
(A) The electrons are shared between atoms
(B) The bond is non-directional
(C) Bond strength depends upon the extent of overlapping
(D) Bond formed may or may not be polar

28. Which of the following have maximum number of unpaired electrons?
(A) Fe^{3+}
(B) Fe^{2+}
(C) Co^{2+}
(D) Co^{3+}

29. The number of bonds in SO_2 is
(A) two σ and 2 π
(B) two σ and 1 π
(C) two σ and 2 π and 1 lone pair
(D) None of these

30. The correct order of electron affinity among the following is
(A) F > Cl > Br
(B) Br > Cl > F
(C) Cl > F > Br
(D) F > Br > Cl

31. Which of the following has correct increasing basic strength
(A) MgO < BeO < CaO < BaO
(B) BeO < MgO < CaO < BaO
(C) BaO < CaO < MgO < BeO
(D) CaO < BaO < BeO < MgO

32. Ionic radii will be maximum in which of the following ions
(A) C^{4-}
(B) N^{3-}
(C) O^{2-}
(D) Mg^{2+}

33. Which of the following will show lowest degree of *paramagnetism* per mole of the compound at 298 K?
(A) $MnSO_4 . 4 H_2O$
(B) $CuSO_4 . 5 H_2O$
(C) $FeSO_4 . 6 H_2O$
(D) $NiSO_4 . 6 H_2O$

34. Trimethylamine $[(CH_3)_3N]$ is a pyramidal molecule and foramide $[HCONH_2]$ is a planer molecule. The hybridization of Nitrogen in both is
(A) sp^2, sp^3
(B) sp^3, sp^2
(C) sp^3, sp^3
(D) sp^2, sp

35. de-Brogalie wavelength associated with a particle of mass 10^{-6} kg moving with a velocity of 10 ms^{-1} is
(A) 6.63×10^{-7} m
(B) 6.63×10^{-16} m
(C) 6.63×10^{-21} m
(D) 6.63×10^{-29} m

[PHYSICS]

36. When a mass is rotating in a plane about a fixed point, its angular momentum is directed along
(A) The radius
(B) The tangent to orbit
(C) The axis of rotation
(D) Line at an angle of 60^0 to the plane of rotation

37. A uniform sphere of mass 2 kg and radius 10 cm is released from rest on an inclined plane makes an angle of 30^0 with the horizontal, its angular acceleration and kinetic energy as it travels 2 m along the plane are,
(A) 25 radians/cm^2 and 19.6 joules
(B) 35 radians/cm^2 and 19.6 joules
(C) 35 radians/cm^2 and 29.6 joules
(D) 25 radians/cm^2 and 99.6 joules

38. The centre of mass of a system of particles of masses 1 kg, 2 kg and 3 kg, placed at the corners of an equilateral triangle of side 1.0 metre is,

(A) $\frac{3.5}{6}, \frac{\sqrt{3}}{4}$

(B) $\frac{5}{6}, \frac{\sqrt{3}}{4}$

(C) $\frac{3.5}{8}, \frac{\sqrt{3}}{4}$

(D) $\frac{3.5}{6}, \frac{\sqrt{3}}{7}$

39. The moment of inertia of a circular ring about its diameter is 100 gm cm^2, then the moment of inertia about an axis passing through its centre and normal to its plane is,
(A) 300 gm cm^2
(B) 100 gm cm^2
(C) 200 gm cm^2
(D) 250 gm cm^2

40. A particle is projected vertically upward from the ground at time $t=0$ and reaches a height h and $t=T$. The greatest height of the particle is,
(A) $\frac{(gT^2+6h)^2}{8T^2}$
(B) $\frac{(gT^2+2h)^2}{2T^2}$
(C) $\frac{(gT^2+2h)^2}{8T^2}$
(D) $\frac{(gT^2+2h)^2}{4T^2}$

41. Two bodies move in the same straight line at the same instant of time from the same origin. The first body moves with a constant velocity of 40 m/sec and second starts with a constant acceleration of 4 m/sec^2. The time that elapses before the second body catches the first body is,
(A) 10 sec
(B) 20 sec
(C) 30 sec
(D) 15 sec

42. A rope has a length of 12 m amd a mass of 16 kg. The rope hangs from a rigid support. A man whose mass is 80 kg slides down the rope at a constant speed of 0.8 m/sec. The tension in the rope at a point 6 m from the top when the man has slide to this point is,
(A) 762.4 N
(B) 862.4 N
(C) 726.2 N
(D) 826.4 N

43. A body moving in a straight line with a constant acceleration 'a' loses ¼ of its initial velocity 'u'. The distance covered by the body during this time is,
(A) 825 m
(B) 285 m
(C) 725 m
(D) 635 m

44. The average kinetic energy of a molecule of a perfect gas is,
(A) $\frac{2}{3}KT$
(B) 1.5 KT
(C) 2.5 KT
(D) 1.66 KT

45. The average translational kinetic energy of the molecule at 27° C is 13.6 x 10^3 kg/m^3. The number of molecules in 1 cm^3 of an ideal gas at 27°C and a pressure of 10 mm of mercury is,
(A) 3.2×10^{17}
(B) 6.2×10^{17}
(C) 1.2×10^{17}
(D) 5.2×10^{12}

46. The half-life of a Cobalt radio-isotope is 5.3 years. The strength of this one milli-curie after a period of one year will be,
(A) 1 milli-curie
(B) 0.77 milli-curie
(C) 0.87 milli-curie
(D) 0.62 milli-curie

47. When the number of nucleons in nuclei increases, the binding energy per nucleon
(A) Increases continuously with mass number
(B) Decreases continuously with mass number
(C) First decreases and then increases with increase in mass number First increases and then decreases with increase in mass number
(D) First increases and then decreases with increase in mass number

48. In photoelectric effect the electrons are not emitted by photosensitive material unless
(A) The wavelength of the incident light exceeds a certain minimum wavelength
(B) The frequency of the incident light exceeds a certain minimum frequency
(C) The velocity of the incident light exceeds a certain minimum velocity
(D) All the above

49. Light quanta with energy of 4.9 eV eject photoelectrons from metal with work function 4.5 eV. The maximum impulse transmitted to the surface of the metal when each electron flies out is,
(A) $3.45 \times 10^{-25}\ kg\ m/sec$
(B) $4.45 \times 10^{-25}\ kg\ m/sec$
(C) $2.45 \times 10^{-25}\ kg\ m/sec$
(D) $1.45 \times 10^{-25}\ kg\ m/sec$

50. X-rays and gamma-rays are both electromagnetic waves. Which of the following statement is false?
(A) Velocity of X-rays and gamma-rays is equal to velocity of light
(B) X-rays have larger wavelength than that of gamma-rays
(C) X-rays have smaller wavelength than that of gamma-rays
(D) None of the above

[MATHEMATICS]

51. If sin α, cos α are the roots of the equation $ax^2 + bx + c = 0$, then
(A) $a^2 + 2ac - b^2 = 0$.
(B) $(a+c)^2 = (b^2 + c^2)^2$.
(C) $a^2 - 2ac + b^2 = 0$.
(D) None of these.

52. If ABCD is a square whose side length is a and AB and AD are axes, then equation of the circle circumscribing the square is given by
(A) $x^2 + y^2 + ax + ay = a^2$.
(B) $x^2 + y^2 - ax - ay = 0$.
(C) $x^2 + y^2 + ax + ay = 0$.
(D) None of these.

53. Which of the following functions is not derivable at x=0 but continuous at x=0?
(A) $f(x) = \begin{cases} x \sin\frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$
(B) $f(x) = \begin{cases} \sin\frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$
(C) $f(x) = x \sin x$
(D) None of these

54. The focus of the parabola $y = 2x^2 + x$ is
(A) (0, 0)
(B) (1/2, 1/4)
(C) (-1/4, 0)
(D) None of these

55. If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in G. P. with same common ratio, then the points (x_1, y_1), (x_2, y_2) and (x_3, y_3)
(A) are the vertices of a triangle.
(B) lie on a straight line.
(C) lie on a circle.
(D) None of these

56. If the sum of first 2n terms of an A.P. 2,5,8,.....is equal to the sum of first n terms of the A.P. 57,59,61,....., then n equals
(A) 10
(B) 12
(C) 11
(D) 13

57. The equation formed by decreasing each root of $ax^2 + bx + c = 0$ by 1 is $x^2 + 4x + 1 = 0$, then
(A) $a = -b$.
(B) $b = -c$.
(C) $a = -c$.
(D) $a + c = b$

58. Let α, β be the roots of equation $x^2 - x + p = 0$ and γ, δ be the roots of equation $x^2 - 4x + q = 0$. If $\alpha, \beta, \gamma, \delta$ are in G.P., then the integral values of p and q are
(A) $-2, -32$
(B) $-2, 3$
(C) $-6, 3$
(D) $-6, -32$

59. The solution of the equation $cos^2\theta + sin\theta + 1 = 0$ lies in the interval

(A) $\left(-\frac{\pi}{4}, \frac{\pi}{4}\right)$.

(B) $\left(\frac{\pi}{4}, \frac{3\pi}{4}\right)$.

(C) $\left(\frac{3\pi}{4}, \frac{5\pi}{4}\right)$.

(D) $\left(\frac{5\pi}{4}, \frac{7\pi}{4}\right)$

60. If the latus rectum of an ellipse is one half of its minor axis, then its eccentricity is

(A) ½.

(B) $1/\sqrt{2}$.

(C) $\sqrt{3}/2$.

(D) None of these

61. The triangle PQR is inscribed in the circle $x^2 + y^2 = 25$. If Q and R have coordinates (3, 4) and (-4, 3), then $\angle QPR$ is equal to

(A) $\frac{\pi}{2}$

(B) $\frac{\pi}{3}$

(C) $\frac{\pi}{4}$

(D) None of these

62. The normal at the point (1, 1) on the curve $2y + x^2 = 3$ is

(A) $x + y = 0$

(B) $x - y = 0$

(C) $x + y + 1 = 0$

(D) None of these

63. The function $f(x) = 2\cos x + x$ has a maxima or minima at x=

(A) $\frac{\pi}{6}$

(B) $\frac{\pi}{3}$

(C) $\frac{\pi}{2}$

(D) None of these

64. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines is

(A) 6

(B) 9

(C) 12

(D) 18

65. The derivative of $(sin^{-1}x + cos^{-1}x)$ with respect to x is

(A) -1

(B) 0

(C) 1

(D) None of these

66. The value of λ for which $f(x) = \begin{cases} \lambda x^2 + 3x, x \leq 2 \\ 2x + 6, x > 2 \end{cases}$ is continuous at x = 2 is

(A) 0

(B) 2

(C) 3

(D) 1

67. If $e^x + e^y = e^{x+y}$, then $\frac{dy}{dx}$ at (2, 2)

(A) 2

(B) 1

(C) -1

(D) e

68. The solution x of the equation $\int_2^x \frac{dt}{t\sqrt{t^2-1}} = \pi/2$ is

(A) π

(B) $\sqrt{3}/2$

(C) $2\sqrt{2}$

(D) None of these

69. $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x}+\sqrt{\cos x}}\, dx$ equals

(A) $\frac{\pi}{4}$

(B) $\frac{\pi}{2}$

(C) 0

(D) 1

70. $\int_0^{10\pi} |\sin x|\, dx$ is equal to

(A) 20

(B) 8

(C) 10

(D) None of these

[ELECTRICAL, ELECTRONICS & COMPUTER]

71. A system program that sets up an executable program in main memory ready for execution is
(A) Assembler
(B) Linker
(C) Loader
(D) Compiler

72. The part of machine level instruction, which tells the central processor what has to be done, is
(A) Operation code
(B) Address
(C) Locator
(D) Flip-Flop

73. An algorithm is best described as
(A) A computer language
(B) A step by step procedure for solving a problem
(C) A branch of mathematics
(D) All of the above

74. Process is
(A) Program in High level language kept on disk
(B) Contents of main memory
(C) A program in execution
(D) A job in secondary memory

75. Bug means
(A) A logical error in a program
(B) A difficult syntax error in a program
(C) Documenting programs using an efficient documentation tool
(D) All of the above

76. Memory
(A) Is a device that performs a sequence of operations specified by instructions in memory
(B) Is the device where information is stored
(C) Is a sequence of instructions
(D) Is typically characterized by interactive processing and time-slicing of the CPU's time to allow quick response to each user.

77. The register or main memory location which contains the effective address of the operand is known as
(A) Pointer
(B) Indexed register
(C) Special location
(D) Scratch pad

78. In which of the storage placement strategies a program is placed in the largest available hole in the main memory?
(A) Best fit
(B) First fit
(C) Worst fit
(D) Buddy

79. The strategy of allowing processes that are to be temporarily suspended is called
(A) Preemptive scheduling
(B) Non preemptive scheduling
(C) Shortest job first
(D) First come first served

80. The Memory Buffer Register (MBR)
(A) Is a hardware memory device which denotes the location of the current instruction being executed.
(B) Is a group of electrical circuits (hardware), that performs the intent of instructions fetched from memory.
(C) Contains the address of the memory location that is to be read from or stored into.
(D) Contains a copy of the designated memory location specified by the MAR after a "read" or the new contents of the memory prior to a "write".

81. Resolution of externally defined symbols is performed by
(A) Linker
(B) Loader
(C) Compiler
(D) Assembler

82. A system program that combines the separately compiled modules of a program into a form suitable for execution
(A) Assembler.
(B) Linking loader.
(C) Cross compiler
(D) Load and go.....

83. What is the name of the technique in which the operating system of a computer executes several programs concurrently by logically runnable and forth between them?
(A) Partitioning
(B) Multitasking
(C) Windowing
(D) Paging

84. A distributed network configuration in which all data/information pass through a central computer is
(A) Bus network
(B) Star network
(C) Ring network
(D) Point-to-point network

85. The process of transferring data intended for a peripheral device into a disk (or intermediate store) so that it can be transferred to peripheral at a more convenient time or in bulk, is known as
(A) Multiprogramming
(B) Spooling
(C) Caching
(D) Virtual programming

86. Which of the following systems software does the job of merging the records from two files into one?
(A) Security software
(B) Utility program
(C) Networking software
(D) Documentation system

87. Which of the following statements is false?
(A) The technique of storage compaction involves moving all occupied areas of storage to one end or other of main storage
(B) Compaction does not involve relocation of programs
(C) Compaction is also known as garbage collection
(D) The system must stop everything while it performs the compaction

88. A transistor has a current gain of 0.99 in the CB mode. Its current gain in the CC mode is
(A) 100
(B) 99
(C) 1.01
(D) 0.99

89. Which of the following addressing modes, facilitates access to an operand whose location is defined relative to the beginning of the data structure in which it appears?
(A) Ascending
(B) Sorting
(C) Index
(D) Indirect

90. Any type of storage that is used for holding information between steps in its processing is
(A) CPU
(B) Primary storage
(C) Intermediate storage
(D) Internal storage

91. The most commonly used semiconductor material is .....
(A) Silicon
(B) Germanium
(C) Mixture of silicon and germanium
(D) None of the above

92. In an n-p-n transistor biased for operation in forward active region
(A) Emitter is positive with respect to base
(B) Collector is positive with respect to base
(C) Base is positive with respect to emitter and collector is positive with respect to base
(D) None of the above

93. The CPU, after receiving an interrupt from an I/O device
(A) Halts for a predetermined time
(B) Hands over control of address bus and data bus to the interrupting device
(C) Branches off to the interrupt service routine immediately
(D) Branches off to the interrupt service routine after completion of the current instruction

94. Which of the following is not a disadvantage of wireless LAN?
(A) Slower data transmission
(B) Higher error rate
(C) Interference of transmissions from different computers
(D) All of the above

95. In virtual memory systems, Dynamic address translation
(A) Is the hardware necessary to implement paging
(B) Stores pages at a specific location on disk
(C) Is useless when swapping is used
(D) Is part of the operating system paging algorithm

96. The time required for a pulse to decrease from 90 to 10 percent of its maximum value is known as
(A) Rise time
(B) Decay time
(C) Binary level transition period
(D) Propagation delay

97. The section of the CPU that selects, interprets and sees to the execution of program instructions
(A) Memory
(B) Register unit
(C) Control unit
(D) ALU

98. At room temperature the current in an intrinsic semiconductor is due to
(A) holes
(B) electrons
(C) ions
(D) holes and electrons

99. Which of the following device is used to connect two systems, especially if the systems use different protocols?
(A) Hub
(B) Bridge
(C) Gateway
(D) Repeater

100. A compiler is
(A) A program that places programs into memory and prepares them for execution
(B) A program that automate the translation of assembly language into machine language
(C) Program that accepts a program written in a high level language and produces an object program
(D) Is a program that appears to execute a source program as if it were machine language

101. Digital design often starts by constructing a _____ table.
(A) Standard
(B) Two-stage
(C) Truth
(D) Two-dimensional

102. The simplified form of the Boolean expression (X + Y + XY)(X + Z) is
(A) X + Y + Z
(B) XY + YZ
(C) X + YZ
(D) XZ + Y

103. Flip-flop outputs are always
(A) Complimentary
(B) The same
(C) Independent of each other
(D) Same as inputs

104. An OR gate has 6 inputs. How many input words are in its truth table?
(A) 64
(B) 32
(C) 16
(D) 128

105. A NOR gate has two or more input signals. All input must be _____ to get a high output
(A) Low
(B) High
(C) Some low some high
(D) 1's

106. How many bits are required to encode all twenty six letters ten symbols, and ten numerals?
(A) 5
(B) 6
(C) 2
(D) 3

107. Which of the following flip-flops is free from race around problem?
(A) T flip-flop
(B) SR flip-flop
(C) Master slave JK flip-flop
(D) All of the above

108. An inverter is also called a _____ gate.
(A) NOT
(B) OR
(C) AND
(D) NAND

109. The maximum number of TTL loads that a TTL device can drive reliably over the specified temperature range is
(A) Fanout
(B) Bipolar
(C) Chip
(D) Universal logic circuit

110. An OR gate can be imagined as
(A) Switches connected in series
(B) Switches connected in parallel
(C) MOS transistors connected in series
(D) All of the above

111. A _____ DBMS distributes data processing tasks between the workstation and a network server.
(A) Network
(B) Relational
(C) Client Server
(D) Hierarchical

112. The binary number 1100 0101 has _____ bytes
(A) 1
(B) 2
(C) 4
(D) 8

113. The ALU carries out arithmetic and logic operations. It processes _____ numbers rather than decimal numbers.
(A) Decimal
(B) Hexadecimal
(C) Binary
(D) All of the above

114. A combinational logic circuit which is used when it is desired to send data from two or more source through a single transmission line is known as
(A) Encoder
(B) Decoder
(C) Multiplexer
(D) Demultiplexer

115. The types of carriers in a semiconductor are
(A) 1
(B) 2
(C) 3
(D) 4

116. An intrinsic silicon sample has 2 million free electrons. The number of holes in the sample is
(A) 2 million
(B) Almost zero
(C) More than 2 million
(D) Less than 2 million

117. In an n type semiconductor
(A) Number of free electrons and holes are equal
(B) Number of free electrons is much greater than the number of holes
(C) Number of free electrons may be equal or less than the number of holes
(D) Number of holes is greater than the number of free electrons

118. A zener diode is used in
(A) Voltage regulator circuit
(B) Amplifier circuits
(C) Both voltage regulator and amplifier circuit
(D) None of the above

119. What is the phase shift between total current and voltage in the circuit of a 100 ohm resistor connected in parallel with a capacitor that has a reactance of 100 ohm
(A) 180 degree
(B) 30 degree
(C) 45 degree
(D) 75 degree

120. In a bipolar transistor which current is largest
(A) Collector current
(B) Base current
(C) Emitter current
(D) Base current or emitter current

121. A transformer has a primary voltage of 120 V rms and a secondary voltage of 25 V rms. If the secondary current is 1A rms, what is the primary current?
(A) 7.8 ma
(B) 208 ma
(C) 200 ma
(D) 300 ma

122. The output voltage of a typical thermocouple is
(A) Less than 100 mv
(B) Greater than 1 V
(C) Thermocouples vary resistance, not voltage.
(D) None of the above

123. The Thevenin equivalent voltage is
(A) Equal to the source voltage
(B) The same as the load voltage
(C) The open circuit voltage
(D) none of the above

124. What is the level of the voltage between the input terminals of an op-amp?
(A) Virtually zero
(B) 5 V
(C) 18 V
(D) None of the Above

125. In applying the superposition theorem,
(A) The sources are considered one at a time with all others replaced by their internal impedance
(B) All sources are considered independently
(C) All sources are considered simultaneously
(D) The sources are considered one at a time with all others replaced by their internal resistance

126. If two currents are in the same direction at any instant of time in a given branch of a circuit, the net current at that instant
(A) Is zero
(B) Is the sum of the two currents
(C) Is the difference between the two currents
(D) Cannot be determined

127. Which one of the following phrases most accurately describes a purely inductive circuit?
(A) Resistances provide the only opposition to current flow
(B) Inductive reactance provides the only opposition to current flow
(C) Combinations of resistance and inductive reactance provide any opposition to current flow
(D) The ac voltage lags the current by 90 degree

128. In order to get maximum power transfer from a capacitive source, the load must
(A) Have a capacitive reactance equal to circuit resistance
(B) Have an impedance that is the complex conjugate of the source impedance
(C) Be as capacitive as it is inductive
(D) None of the above

129. The two basic components of a Thevenin equivalent ac circuit are
(A) The equivalent voltage source and the equivalent series impedance
(B) The equivalent voltage source and the equivalent series resistance
(C) The equivalent voltage source and the equivalent parallel impedance
(D) The equivalent voltage source and the equivalent parallel resistance

130. In a CRO which of the following is not a part of electron gun
(A) Cathode
(B) Grid
(C) Accelerating anode
(D) X - Y plates

131. In measurements using CRO, Lissajous patterns are used to
(A) Measure magnitude of peak voltage
(B) Measure frequency
(C) Measure impedance
(D) Measure current

132. Induction wattmeter can be used in
(A) AC circuit only
(B) DC circuit only
(C) Both AC and DC circuit
(D) AC 3 phase only

133. Which of the following performance specifications applies to a sample-and-hold circuit?
(A) Aperture time
(B) Aperture droop
(C) Feedback
(D) Acquisition jitter

134. An LVDT is used to measure displacement. The LVDT feeds a Voltmeter of 0-5 V range through a 250 gain amplifier. For a displacement 0.5 mm the output of LVDT is 2 mv. The sensitivity of instrument is
(A) 0.1 V/mm
(B) 0.5 V/mm
(C) 1 V/mm
(D) 5 V/mm

135. A transformer is plugged into a 120 V rms source and has a primary current of 300 mA rms. The secondary is providing 18 V across a 10 ohm load. What is the efficiency of the transformer?
(A) 88%
(B) 90%
(C) 92%
(D) 95%

136. Potentiometer method of dc voltage measurement is more accurate than direct measurement using a voltmeter because
(A) It loads the circuit to maximum extent
(B) It loads the circuit moderately
(C) It does not load the circuit at all
(D) It uses centre zero galvanometer instead of Voltmeters

137. Which of these has a magnetic brake?
(A) Thermocouple ammeter
(B) Energy meter
(C) Dynamometer wattmeter
(D) Frequency meter

138. In a two-source circuit, one source acting alone produces 12 ma through a given branch. The other source acting alone produces 10 ma in the opposite direction through the same branch. The actual current through the branch is
(A) 22 ma
(B) 12 ma
(C) 10 ma
(D) 2 ma

139. A single phase energy meter has the rating 1200 revolutions/ kwh. If a 500 W electric gadget is used for 4 hours, the energy meter will make
(A) 1200 revolutions
(B) 1800 revolutions
(C) 2100 revolutions
(D) 2400 revolutions

140. When measuring Phase Angle between two waves using a CRO, the time base generator is connected to
(A) X plate
(B) Y plate
(C) Both X and Y plate
(D) Neither X nor Y plates

141. With a variable reluctance tachometer having 60 rotor teeth the count reads 3600 counts per minute. The speed in RPM is
(A) 36
(B) 60
(C) 360
(D) 3600

142. When a capacitor is connected to the terminals of an ohmmeter, the pointer indicated a low resistance initially and finally came to infinity position. This shows that capacitor is
(A) Short circuited
(B) All right
(C) Faulty
(D) Open circuited

143. The household energy meter is
(A) Indicating instrument
(B) Recording instrument
(C) Integrating instrument
(D) None of the above

144. Kelvin's double bridge is used to measure low resistances because
(A) It has high sensitivity
(B) There is no thermoelectric emf
(C) Resistance variation due to temperature
(D) Effect of contact and lead resistances is eliminated

145. The number of p-n junctions in a semiconductor diode are
(A) 0
(B) 1
(C) 2
(D) 1 or 2

146. In which material do conduction and valence bands overlap
(A) Insulators
(B) Conductors
(C) Both conductor and semiconductor
(D) Semiconductors

147. Thermistors are made of
(A) Pure metals
(B) Pure insulators
(C) Tintered mixture of metallic oxides
(D) pure semiconductors

148. Shaft encoder is used to measure
(A) Angular position
(B) Linear position
(C) Linear velocity
(D) linear acceleration

149. De Sauty bridge is very widely used due to
(A) Simplicity
(B) Perfect balance for imperfect capacitor
(C) Perfect balance for air capacitors
(D) Maximum sensitivity

150. Which instrument needs creep compensation?
(A) Dynamometer wattmeter
(B) Induction wattmeter
(C) Energy meter
(D) Frequency meter