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QUESTION BOOKLET – ADVANCED TEST FOR RECRUITMENT TO TECHNICAL CADRE POSTS

Post:	Technical Assistant
Department	Physics
Advt.:	01/2026 dated 09.01.2026
Date of Exam:	23-08-2026
Duration:	2 Hours
Total Marks:	200 (100 Q X 2 M each)
No. of Questions:	100 (MCQs)
Negative Marking:	1/4th mark for every wrong answer

INSTRUCTIONS TO THE CANDIDATES

1. This is an Advanced Test comprising 100 Multiple Choice Questions (MCQs), to be conducted in MCQ mode only.
2. The duration of the test is 2 hours.
3. Answers must be marked on the OMR Answer Sheet using a blue or black ballpoint pen only. Use of pencils is not permitted.
4. Candidates must write/mark their Roll Number, Post applied for, and other required details in the designated space on the OMR Answer Sheet.
5. Answers marked on the Question Booklet or on any sheet other than the OMR Answer Sheet will not be evaluated.
6. For each question, darken the circle corresponding to the correct answer completely and clearly on the OMR Answer Sheet.
7. Each question carries equal marks. There will be a negative marking of ¼ th mark for every wrong answer. No marks will be deducted for questions not attempted.
8. Mark only one answer for each question. Marking more than one circle for a question will be treated as a wrong answer.
9. Overwriting, cutting, or erasing that leaves the OMR Answer Sheet unclear may result in the answer not being evaluated.
10. No candidate shall leave the examination hall during the test.
11. Any attempt to copy, use unfair means, or communicate with others will result in immediate disqualification.
12. The use of electronic gadgets, calculators, mobile phones, smart watches, or any written/printed material is strictly prohibited.
13. Rough work, if any, should be done only on the separate sheet provided for the purpose.
14. Ensure that the OMR Answer Sheet is duly filled and handed over to the Invigilator before leaving the examination hall.
15. Failure to submit the OMR Answer Sheet will result in cancellation of candidature.
16. All material provided, including rough sheets, must be returned before leaving the examination hall.

1. Which Maxwell equation predicts the absence of magnetic monopoles?
   (a) $\nabla \cdot E = \rho/\varepsilon_0$
   (b) $\nabla \times E = -\partial B/\partial t$
   (c) $\nabla \cdot B = 0$
   (d) $\nabla \times H = J + \partial D/\partial t$

2. Which of the following boundary conditions is correct at the interface between two media?
   (a) The tangential component of the electric field (E) is continuous.
   (b) The normal component of the magnetic flux density (B) is discontinuous.
   (c) The tangential component of the magnetic field (H) is always zero.
   (d) The normal component of the electric flux density (D) is continuous even in the presence of surface charge.

3. The time-averaged Poynting vector for a sinusoidal wave is proportional to:
   (a) E_0^2
   (b) B_0^2 only
   (c) Frequency only
   (d) Charge density

4. Which one of the following statements correctly describes the nature of magnetic field lines?
   (a) Magnetic field lines originate at the north pole and terminate at the south pole, forming open curves.
   (b) Magnetic field lines form continuous closed loops, emerging from the north pole and entering the south pole outside the magnet, and returning through the magnet from south to north.
   (c) Magnetic field lines are always straight lines directed from the north pole to the south pole.
   (d) Magnetic field lines always form spiral curves around a magnet.

5. The magnetic field due to a current is given by:
   (a) Coulomb's law
   (b) Ohm's law
   (c) Snell's law
   (d) Biot–Savart law

6. Maxwell introduced displacement current to modify:
   (a) Coulomb's law
   (b) Ampere's law
   (c) Biot–Savart law
   (d) Faraday's law

7. The electric field inside a hollow conducting sphere is:
   (a) Maximum
   (b) Infinite
   (c) Constant
   (d) Zero

8. Faraday's law in differential form is:
(a) $\nabla \times \mathrm{E} = 0$
(b) $\nabla \cdot \mathrm{E} = \rho/\varepsilon_0$
(c) $\nabla \times \mathrm{E} = -\frac{\partial \mathrm{B}}{\partial t}$
(d) $\nabla \times \mathrm{H} = \mathrm{J}$

9. Which pair of Maxwell's equations leads directly to the electromagnetic wave equation in free space?
(a) Gauss's laws
(b) Gauss's law and Ampère's law
(c) Faraday's law and Ampère-Maxwell law
(d) Coulomb's law and Faraday's law

10. The displacement current between the plates of a charging capacitor is:
(a) Zero
(b) Equal to the conduction current in the connecting wires
(c) Greater than the conduction current
(d) Opposite to the conduction current

11. Circular polarization of an electromagnetic wave is obtained when its two mutually perpendicular electric field components have:
(a) Equal amplitudes and zero phase difference
(b) Equal amplitudes and a phase difference of $180°(\pi$ radians)
(c) Unequal amplitudes and a phase difference of $180°(\pi$ radians)
(d) Equal amplitudes and a phase difference of $90°(\pi/2$ radians)

12. The susceptibility of vacuum is:
(a) 1
(b) 0
(c) Infinity
(d) –1

13. The dielectric strength of a material refers to:
(a) Its electrical conductivity
(b) The maximum electric field it can withstand without breakdown
(c) Its magnetic permeability
(d) Its thermal conductivity

14. According to Snell's law,
(a) $n_1 \sin\theta_1 = n_2 \sin\theta_2$
(b) $n_1 \cos\theta_1 = n_2 \cos\theta_2$
(c) $n_1 \tan\theta_1 = n_2 \tan\theta_2$
(d) $n_1 = n_2$

15. If commutator of two operators, $[\,\hat{A}\,,\hat{B}\,] = 0$, then $\hat{A}$ and $\hat{B}$:
(a) Cannot have simultaneous eigenstates
(b) Must both be zero
(c) Must be equal
(d) Can have simultaneous eigenstates

16. For a stationary state, the probability density $|\psi(x,t)|^2$:
(a) Oscillates in time
(b) Is independent of time
(c) Decays exponentially
(d) Is always zero

17. For a particle in a one-dimensional infinite box of length L, the energy of n^{th} level varies as:
(a) $E_n \propto n$
(b) $E_n \propto 1/n^2$
(c) $E_n \propto \sqrt{n}$
(d) $E_n \propto n^2$

18. The uncertainty principle arises due to the:
(a) Relativity
(b) Electromagnetism
(c) Wave-particle duality
(d) Gravitation

19. The orbital angular momentum quantum number l for a given principal quantum number n in hydrogen ranges over:
(a) $l = 0$ to n
(b) $l = 0$ to $n - 1$
(c) $l = -n$ to n
(d) $l = 1$ to n

20. The eigenvalues of a Hermitian operator are:
(a) Always complex
(b) Always real
(c) Always purely imaginary
(d) Always zero

21. For a particle incident on a real one-dimensional step potential, the reflection coefficient R and transmission coefficient T satisfy:
(a) $R + T = 0$
(b) $R + T = 1$
(c) $R - T = 1$
(d) $R \times T = 1$

22. The number of bound states in a 1D finite square well is:
(a) Always infinite
(b) Always exactly one
(c) Finite, and depends on the well depth and width
(d) Always zero

23. Alpha decay of radioactive nuclei is a classic application of:
(a) Particle in a box
(b) Step potential reflection
(c) Harmonic oscillator motion
(d) Quantum tunnelling

24. If the width of an infinite box is doubled, the ground state energy:
(a) Doubles
(b) Halves
(c) Becomes one-fourth
(d) Remains the same

25. The zero-point energy $\frac{1}{2}\hbar\omega$ of the ground state of a quantum harmonic oscillator is a direct consequence of:
(a) Thermal effects
(b) The uncertainty principle
(c) Numerical error in the eigenvalue solution
(d) None of the above

26. For a quantum harmonic oscillator, the ladder (creation and annihilation) operators satisfy:
(a) $[\hat{a}, \hat{a}^\dagger] = 0$
(b) $[\hat{a}, \hat{a}^\dagger] = -1$
(c) $[\hat{a}, \hat{a}^\dagger] = 1$
(d) $\hat{a}\hat{a}^\dagger = \hat{a}^\dagger\hat{a}$

27. The degeneracy of the hydrogen atom energy level E_n(ignoring electron spin) is:
(a) n
(b) $2n$
(c) n^2
(d) $2n + 1$

28. When a particle with energy $E > V_0$ encounters a potential step $V(x) = 0$ for $x < 0$ and $V(x) = V_0$ for $x > 0$,
(a) Complete reflection occurs
(b) Complete transmission occurs
(c) Partial reflection and transmission occur
(d) None of the option is correct

29. The Hamiltonian operator in the Schrödinger equation corresponds to which classical quantity?
(a) Momentum
(b) Angular momentum
(c) Force
(d) Total energy

30. Which thermodynamic potential is minimized when a system is maintained at constant temperature and volume?
(a) Enthalpy H
(b) Gibbs free energy G
(c) Helmholtz free energy F
(d) Internal energy U

31. A system has e^6equally probable microstates. Its entropy is:
(a) $3k_B$
(b) $6k_B$
(c) $e^6 k_B$
(d) k_B/e^6

32. In the canonical ensemble, the thermodynamic quantity that fluctuates is:
(a) Temperature
(b) Number of particles
(c) Volume
(d) Energy

33. A system has a partition function $Z = e^2$at temperature T. The Helmholtz free energy is:
(a) $2k_B T$
(b) $-2k_B T$
(c) $k_B T/2$
(d) $-\frac{k_B}{T}/2$

34. For a system in thermal equilibrium with a heat bath, the probability of occupying a state of energy E_i is proportional to ($\beta = \frac{1}{k_B T}$):
(a) E_i^{-1}
(b) E_i
(c) $e^{-\beta E_i}$
(d) $e^{+\beta E_i}$

35. Which of the following statements correctly distinguishes Bose-Einstein and Fermi-Dirac statistics?
(a) Bosons obey the Pauli exclusion principle.
(b) Fermions can all occupy the same quantum state.
(c) Bosons may occupy the same quantum state in unlimited numbers.
(d) Both statistics become identical at very low temperatures.

36. A degenerate Fermi gas is obtained when:
(a) The thermal energy is much larger than the Fermi energy.
(b) The temperature is much smaller than the Fermi temperature.
(c) The gas behaves classically.
(d) The particle density is extremely small.

37. Planck introduced the concept of energy quantization primarily to explain:
(a) Brownian motion
(b) Specific heat of solids
(c) Photoelectric emission
(d) Black-body radiation

38. The peak wavelength of black-body radiation emitted by a body at 5800 K is closest to:
(Given $b = 2.9 \times 10^{-3}$ m K)
(a) 5×10^{-7}m
(b) 2.9×10^{-3}m
(c) 16.82 m
(d) 5.8×10^{3} m

39. If the absolute temperature of a black body is doubled, its total radiated power becomes:
(a) Twice
(b) Four times
(c) Eight times
(d) Sixteen times

40. During a first-order phase transition, the latent heat per mole is $L = 3000$ J mol^{-1}at $T = 300$ K. The entropy change per mole is:
(a) 1 J mol ^{1}K^{-1}
(b) 10 J mol^{-1}K^{-1}
(c) 100 J mol^{-1}K^{-1}
(d) 3000 J mol^{-1}K^{-1}

41. At a second-order (continuous) phase transition:
(a) Entropy is discontinuous.
(b) Latent heat is released.
(c) Heat capacity may diverge while entropy remains continuous.
(d) Volume changes discontinuously.

42. For a free electron gas, $E_F \propto n^{\alpha}$, where n is the electron number density. The value of α is:
(a) 1/2
(b) 2/3
(c) 1
(d) 3/2

43. For an ideal Bose gas below the critical temperature T_c, the fraction of particles in the condensate at temperature T is:
(a) $\frac{N_0}{N} = 1 - \frac{T}{T_c}$
(b) $\frac{N_0}{N} = 1 - \left(\frac{T}{T_c}\right)^{3/2}$
(c) $\frac{N_0}{N} = \left(\frac{T}{T_c}\right)^{3/2}$
(d) $\frac{N_0}{N} = e^{-T/T_c}$

44. In the thermodynamic limit, phase transitions become sharp because:
(a) The number of particles becomes very large.
(b) Quantum effects disappear.
(c) The partition function becomes independent of temperature.
(d) Entropy becomes zero.

45. In hydrogen-like ions, the spin-orbit splitting (fine-structure energy separation) ΔE_{SO} scales with the atomic number Z as:
(a) $\Delta E_{SO} \alpha Z^2$
(b) $\Delta E_{SO} \alpha Z^3$
(c) $\Delta E_{SO} \alpha Z^4$
(d) $\Delta E_{SO} \alpha Z^6$

46. Which of the following transitions is ALLOWED under the electric dipole selection rules in an LS-coupled multi-electron atom?
(a) $^3P_0 \rightarrow {}^3P_0$
(b) $^2D_{3/2} \rightarrow {}^2P_{1/2}$
(c) $^1S_0 \rightarrow {}^3P_1$
(d) $^2P_{1/2} \rightarrow {}^2F_{5/2}$

47. How many distinct fine-structure levels (values of J) arise from a ^3D term (S = 1, L = 2)?
(a) 2
(b) 7
(c) 5
(d) 3

48. Calculate the Landé g-factor for the term $^2P_{3/2}$ (L = 1, S = 1/2, J = 3/2).
(a) 4/3
(b) 2
(c) 1
(d) 2/3

49. Hyperfine structure is caused by interaction between:
(a) Electronic orbit and external field
(b) Electron and nuclear magnetic moments
(c) Vibrational and rotational modes
(d) Photon and phonon states

50. Franck–Condon principle states that electronic transitions are most probable when:
(a) Nuclear positions change significantly during the transition
(b) Spin-orbit coupling vanishes
(c) Rotational motion disappears
(d) Nuclear positions remain effectively fixed during the transition

51. The rotational constant of $^{12}C^{16}O$ is B = 1.931 cm^{-1}. Assuming the bond length is unchanged, predict the rotational constant of $^{13}C^{16}O$.
(a) ≈ 1.846 cm^{-1}
(b) ≈ 1.931 cm^{-1} (unchanged)
(c) ≈ 2.021 cm^{-1}
(d) ≈ 1.653 cm^{-1}

52. When a molecular sample is illuminated with laser light of frequency ν_0, the scattered radiation is observed at $\nu_0 \pm \Delta\nu$. Which of the following statements correctly describes Raman scattering?
(a) Stokes lines are higher frequency than anti-Stokes lines and are more intense at room temperature.
(b) A molecule is Raman active if its electric dipole moment changes during vibration.
(c) Anti-Stokes lines appear at a higher frequency ($\nu_0 + \Delta\nu$) and are less intense than Stokes lines at room temperature.
(d) Raman scattering is a resonant absorption process followed by spontaneous fluorescence.

53. In the electronic absorption spectrum of a diatomic molecule, the excited-state equilibrium bond length is significantly larger than the ground-state bond length. According to the Franck–Condon principle, the most intense vibronic band (from $v''=0$) terminates in:
(a) A high vibrational level ($v' > 0$) of the excited state, since the vertical transition from the $v''=0$ turning point projects onto a high-v' region of the displaced excited-state potential curve.
(b) The $v'=0$ level of the excited state, regardless of any bond-length change.
(c) The dissociation continuum only, never a bound vibrational level.
(d) A level with $v' = v''$ always, satisfying a strict $\Delta v = 0$ rule.

54. The pure rotational (microwave) absorption spectrum of the CO molecule shows lines spaced 3.86 cm^{-1} apart. Given the reduced mass of CO, $\mu = 1.14 \times 10^{-26}$ kg, calculate the equilibrium bond length. ($h = 6.626\times10^{-34}$ J·s, $c = 3\times10^{8}$ m/s)
(a) 1.13 Å
(b) 0.113 Å
(c) 2.26 Å
(d) 11.3 Å

55. The lifetime of an atomic state is 10 nanoseconds. The natural linewidth of the spectral line in the emission spectrum of this state is of the order of:
(a) 10^{-10} eV
(b) 10^{-6} eV
(c) 10^{-8} eV
(d) 10^{-5} eV

56. The equilibrium vibration frequency for an oscillator is observed at 2990 cm^{-1}. The ratio of the frequencies corresponding to the first and the fundamental spectral lines is 1.96. Considering the oscillator to be anharmonic, the anharmonicity constant is:
(a) 0.005
(b) 0.1
(c) 0.02
(d) 0.2

57. In a three-level laser system, the pump typically excites atoms to:
(a) The ground state directly
(b) A level above the metastable upper laser level
(c) A level below the ground state
(d) The same level as the laser transition

58. In heavy atoms (large atomic number Z), spectral fine structure is described better by jj coupling than by LS (Russell–Saunders) coupling. This is because:
(a) The spin-orbit interaction energy (which scales roughly as Z^4) dominates over the residual electrostatic interaction between electrons.
(b) The electrostatic interaction between electrons grows faster than the spin-orbit interaction with increasing Z.
(c) Electron spins uncouple from each other only in light atoms.
(d) The orbital angular momenta of individual electrons vanish for large Z.

59. According to Moseley's law for characteristic X-ray Kα emission, the frequency satisfies $\nu \propto (Z - b)$. What is the value of screening constant b for Kα lines, and what is the ratio of wavelengths $\lambda(Cu) / \lambda(Fe)$ for Copper (Z = 29) and Iron (Z = 26)?
(a) $b = 1$; $\lambda(Cu)/\lambda(Fe) \approx 0.797$
(b) $b = 1$; $\lambda(Cu)/\lambda(Fe) \approx 1.254$
(c) $b = 7.4$; $\lambda(Cu)/\lambda(Fe) \approx 0.741$
(d) $b = 0$; $\lambda(Cu)/\lambda(Fe) \approx 0.803$

60. In the face-centred cubic structure, the nearest neighbours to a given atom lie in the plane direction of:
(a) <100>
(b) <111>
(c) <110>
(d) <311>

61. What is the coordination number of a simple cubic (SC) crystal structure?
(a) 4
(b) 6
(c) 8
(d) 12

62. Consider X-ray diffraction from a crystal with a face-centered cubic (FCC) lattice. Which of the following sets of Miller indices will produce no diffraction reflection?
(a) (020)
(b) (111)
(c) (221)
(d) (222)

63. In an ionic crystal, the bonding arises due to:
(a) Sharing of electrons between atoms
(b) Attraction between oppositely charged ions
(c) Interaction between permanent dipoles
(d) Overlapping of molecular orbitals only

64. Consider two identical inert gas atoms separated by a distance R. The van der Waals interaction between the atoms, arising from induced dipole–induced dipole interactions, varies with R as:
(a) R^{-4}
(b) R^{-6}
(c) R^{-5}
(d) R^{-3}

65. The total lattice energy of an ionic crystal is given by the equation: $E = \frac{-\alpha q^2}{R} + \frac{\rho}{R^4}$ (in CGS units), where α is the Madelung constant, R is the nearest-neighbour separation in the crystal, and ρ is a constant. What is the value of ρ at the equilibrium separation R_0?

(a) $\frac{\alpha q^2 R_0^3}{4}$

(b) $\frac{\alpha q^2 R_0^3}{5}$

(c) $\frac{\alpha q^2 R_0^5}{4}$

(d) $\frac{\alpha q^2 R_0^3}{5}$

66. Consider a three-dimensional specimen containing N primitive cells. If there are N acoustic phonon modes, the cutoff wave vector in k-space is proportional to:

(a) $N^{1/3}$

(b) $N^{2/3}$

(c) N^3

(d) $N^{3/2}$

67. Consider a one-dimensional free electron gas, taking into account quantum theory and the Pauli exclusion principle. An electron of mass m is confined to a length L by infinite potential barriers. What is the Fermi energy (E_F) of a system containing six electrons in its ground state?

(a) $E_F = \frac{4\hbar^2}{m}\left(\frac{\pi}{L}\right)^2$

(b) $E_F = \frac{\hbar^2}{2m}\left(\frac{\pi}{L}\right)^2$

(c) $E_F = \frac{18\hbar^2}{m}\left(\frac{\pi}{L}\right)^2$

(d) $E_F = \frac{9\hbar^2}{2m}\left(\frac{\pi}{L}\right)^2$

68. The dispersion relation for phonons in a one-dimensional monoatomic Bravais lattice is given by:

$$\omega^2 = \frac{4C}{M}\sin^2\left(\frac{ka}{2}\right)$$

where ω, C, M, k, and a represent the angular frequency of oscillation, force constant, mass of the atom, wave vector, and lattice spacing, respectively. What is the group velocity (v_g) at the edge of the first Brillouin zone $\left(k = \frac{\pi}{a}\right)$?

(a) Zero

(b) $\left(\frac{Ca^2}{M}\right)^{1/2}$

(c) $\left(\frac{Ca^2}{M}\right)^2$

(d) $\left(\frac{Ca}{M}\right)^{1/2}$

69. At low temperatures (below the Debye and Fermi temperatures), the specific heat of a metal depends on temperature T. If a and b are constants, the specific heat is given by:
(b) $aT + bT^3$
(c) $a + bT^2$
(d) $aT + bT^5$
(e) $aT + bT^2$

70. In a two-dimensional electron gas, the electronic density n is related to the Fermi energy E_F as:
(a) $n \propto E_F^{1/2}$
(b) $n \propto E_F$
(c) $n \propto E_F^{3/2}$
(d) $n \propto E_F^{1/3}$

71. The drift velocity of electrons in a conductor is directly proportional to which of the following quantities?
(a) Electric field
(b) Magnetic field
(c) Pressure
(d) Temperature

72. In a lightly doped n-type Germanium semiconductor, the Fermi level is located:
(a) Within the forbidden energy gap
(b) At the edge of the conduction band
(c) Closer to the valence band
(d) At the intrinsic Fermi level

73. The effective mass of an electron in silicon depends on which of the following factors?
(a) Energy separation between the conduction band and valence band
(b) Atomic weight
(c) Electron density
(d) Band structure

74. The dielectric constant of a material is also known as:
(a) Relative permittivity
(b) Electrical conductivity
(c) Magnetic permeability
(d) Electrical resistivity

75. Ferrimagnetic materials are characterized by:
(a) Equal and opposite magnetic moments
(b) Unequal and opposite magnetic moments
(c) Absence of magnetic moments
(d) Randomly oriented magnetic moments

76. Type-II superconductors are widely used in practical applications because they:
(a) Become insulators below the critical temperature
(b) Lose superconductivity at low magnetic fields
(c) Have high electrical resistance
(d) Can operate under high magnetic fields

77. Charge carriers in p-type semiconductor are:
(a) Electrons
(b) Holes
(c) Ions
(d) Electrons and holes

78. A silicon (Si) sample is uniformly doped with boron at a concentration of 1.0×10^{15} cm^{-3}. The intrinsic carrier concentration is $1.5 \times 10^{10} atom/cm^3$. Assuming complete ionization of the acceptor impurities, what is the equilibrium electron concentration (n_0) at 300 K?
(a) 1.5×10^{10}
(b) 2.25×10^{10}
(c) 1.5×10^{5}
(d) 2.25×10^{5}

79. In a semiconductor at thermal equilibrium, which of the following is true?
(a) Drift current is equal in magnitude and opposite in direction to the diffusion current.
(b) Drift current is greater than the diffusion current.
(c) Diffusion current is greater than the drift current.
(d) Both drift current and diffusion current are zero.

80. A conventional Schottky diode is formed by:
(a) PN junction
(b) Metal-Semiconductor junction
(c) Metal-Metal junction
(d) Metal-Insulator junction

81. Forward bias of a PN junction reduces:
(a) Barrier potential
(b) Carrier concentration
(c) Current
(d) Conductivity

82. In the active region of a transistor, the biasing condition is:
(a) Both junctions reverse biased
(b) Both junctions forward biased
(c) Emitter-base junction forward biased and collector-base junction reverse biased
(d) Emitter-base junction reverse biased and collector-base junction forward biased

83. A Field Effect Transistor (FET) is a:
(a) Current-controlled device
(b) Frequency-controlled device
(c) Power-controlled device
(d) Voltage-controlled device

84. Positive feedback is mainly used in electronic circuits to produce:
(a) Amplification with reduced distortion
(b) Oscillations
(c) Rectification of AC signals
(d) Signal filtering

85. An electronic oscillator converts:
(a) DC power into AC signal
(b) AC signal into DC power
(c) Heat energy into electrical energy
(d) Light energy into electrical energy

86. An RC phase shift oscillator uses:
(a) a RC network
(b) a LC network
(c) a quartz Crystal
(d) a transformer

87. The input impedance of an ideal op-amp is:
(a) Zero
(b) Infinite
(c) Very low
(d) 100 Ω

88. An XOR gate produces a HIGH output when:
(a) Both inputs are the same
(b) Both inputs are HIGH
(c) Both inputs are LOW
(d) Inputs are different

89. A register in digital electronics is mainly used for:
(a) Voltage regulation
(b) Temporary storage of binary data
(c) Signal amplification
(d) AC to DC conversion

90. The full form of I.E. Act is:
(a) Indian Engineering Act
(b) Indian Electricity Act
(c) International Energy Act
(d) Industrial Equipment Act

91. Which of the following is a "Do" for a substation operator?
(a) Wear appropriate PPE and follow safety procedures before entering the substation
(b) Operate equipment after observing system conditions without proper authorization
(c) Enter the substation without PPE if the task is of short duration
(d) Approach electrical equipment after switching off supply without confirming isolation

92. An electrical shock occurs when:
(a) Electric current flows through the human body
(b) A person comes near an electrical device without touching it
(c) Electrical voltage is present in an isolated circuit
(d) An electrical appliance consumes power during operation

93. Before rescuing a person from an electric shock, the first step should be to:
(a) Touch the victim to check the condition
(b) Pull the victim away immediately with bare hands
(c) Pour water on the victim to cool the body
(d) Switch off the power supply

94. Which of the following methods is commonly used for providing artificial respiration to a person in an emergency?
(a) Mouth-to-mouth respiration
(b) Spraying water on the face
(c) Performing massage only
(d) Applying ice treatment

95. Which type of fire extinguisher is most suitable for extinguishing an electrical fire?
(a) Water extinguisher
(b) CO_2 extinguisher
(c) Foam extinguisher
(d) Dry sand extinguisher

96. MCB stands for:
(a) Main Control Board
(b) Motor Control Box
(c) Miniature Circuit Breaker
(d) Main Current Bus

97. Earthing in an electrical system is mainly provided to:
(a) Provide a low-resistance path for fault current and protect against electric shock
(b) Increase the current-carrying capacity of electrical conductors during normal operation
(c) Control supply voltage fluctuations during normal operation
(d) Improve the power factor and efficiency of electrical equipment

98. Which instrument is used to measure insulation resistance?
(a) Voltmeter
(b) Ammeter
(c) Megger
(d) Wattmeter

99. A fuse is used to protect an electrical circuit against:
(a) Excessive current flow
(b) Low voltage conditions only
(c) High temperature conditions only
(d) Electrical noise

100. Overloading an electrical circuit may lead to:
(a) Improved energy efficiency
(b) Improvement in insulation strength
(c) Reduction in current flow
(d) Fire hazard due to excessive current flow

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