राष्ट्रीय प्रौद्योगिकी संस्थान वरंगल
वरंगल – 506004, तेलंगाना, भारत
NATIONAL INSTITUTE OF TECHNOLOGY WARANGAL
WARANGAL – 506004, Telangana, INDIA

QUESTION BOOKLET – ADVANCED TEST FOR RECRUITMENT TO TECHNICAL CADRE POSTS

Post:	Technician
Department	Physics
Advt.:	01/2026 dated 09.01.2026
Date of Exam:	18-08-2026
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.

Q1. According to the law of conservation of charge, the total electric charge in an isolated system is:
A. Always increasing
B. Always decreasing
C. Constant
D. Zero

Q2. The SI unit of electric charge is:
A. Volt
B. Coulomb
C. Ampere
D. Ohm

Q3. Coulomb's law is applicable to:
A. Stationary point charges
B. Moving charges only
C. Magnetic poles
D. Current-carrying conductors

Q4. If the distance between two point charges is doubled, the electrostatic force becomes:
A. Four times
B. Half
C. One-fourth
D. Double

Q5. The electrostatic force between two charges acts along:
A. A circular path
B. The line joining the charges
C. A tangent to the charges
D. A random direction

Q6. The principle of superposition is used to determine:
A. Total resistance
B. Net electric force due to multiple charges
C. Magnetic flux
D. Electric power

Q7. The electric field intensity at a point is defined as:
A. Force per unit charge
B. Charge per unit area
C. Energy per unit charge
D. Current per unit area

Q8. The SI unit of electric field intensity is:
A. V
B. N/C
C. A/m
D. W

Q9. Electric field lines never:
A. Originate from positive charges
B. Terminate at negative charges
C. Intersect each other
D. Represent the field direction

Q10. The electric field inside a conductor in electrostatic equilibrium is:
A. Maximum
B. Infinite
C. Zero
D. Constant

Q11. An electric dipole consists of:
A. Two equal positive charges
B. Two equal negative charges
C. Two equal and opposite charges separated by a small distance
D. Three equal charges

Q12. The SI unit of electric dipole moment is:
A. C·m
B. N/C
C. V/m
D. Wb

Q13. A dipole placed in a uniform electric field experiences:
A. Only force
B. Only torque
C. Both force and torque
D. Neither force nor torque

Q14. Electric flux is the measure of:
A. Magnetic field
B. Electric field passing through a surface
C. Electric current
D. Electric resistance

Q15. Gauss's law relates electric flux with:
A. Potential difference
B. Enclosed charge
C. Resistance
D. Current

Q16. The electric field inside a uniformly charged conducting spherical shell is:
A. Infinite
B. Zero
C. Uniform but non-zero
D. Maximum at the center

Q17. The electric field outside a charged spherical shell behaves as if:
A. Charge is uniformly spread in space
B. Entire charge is concentrated at the center
C. There is no charge
D. Charge is concentrated on one side

Q18. Electric potential is defined as:
A. Force per unit charge
B. Work done per unit charge
C. Energy per unit current
D. Current per unit charge

Q19. The SI unit of electric potential is:
A. Ampere
B. Volt
C. Coulomb
D. Joule

Q20. Equipotential surfaces are always:
A. Parallel to electric field lines
B. Perpendicular to electric field lines
C. Circular only
D. Randomly oriented

Q21. The capacitance of a capacitor depends upon:
A. Plate area
B. Distance between plates
C. Dielectric material
D. All of the above

Q22. The SI unit of capacitance is:
A. Henry
B. Tesla
C. Farad
D. Weber

Q23. Capacitors connected in parallel have:
A. Same charge
B. Same current
C. Same voltage
D. Same resistance

Q24. Electric current is defined as the rate of flow of:
A. Voltage
B. Electric charge
C. Resistance
D. Magnetic flux

Q25. The SI unit of electric current is:
A. Coulomb
B. Ampere
C. Volt
D. Watt

Q26. The drift velocity of electrons in a conductor is:
A. Equal to the speed of light
B. The average velocity acquired by free electrons under an electric field
C. Greater than the speed of light
D. Independent of the applied electric field

Q27. Mobility of charge carriers is defined as:
A. Drift velocity per unit electric field
B. Electric field per unit current
C. Resistance per unit length
D. Current per unit voltage

Q28. The SI unit of mobility is:
A. $m^2/(V \cdot s)$
B. C/s
C. $\Omega \cdot m$
D. V/m

Q29. Ohm's law is applicable to:
A. All conductors
B. Ohmic conductors at constant temperature
C. Semiconductors only
D. Superconductors only

Q30. According to Ohm's law, if the resistance remains constant, the current is:
A. Inversely proportional to voltage
B. Directly proportional to voltage
C. Independent of voltage
D. Equal to voltage

Q31. The V-I characteristic of an ideal resistor is:
A. Circular
B. Hyperbolic
C. Straight line passing through the origin
D. Parabolic

Q32. The SI unit of electrical resistivity is:
A. Ω
B. $\Omega \cdot m$
C. S/m
D. W

Q33. The reciprocal of resistivity is called:
A. Conductance
B. Conductivity
C. Resistance
D. Reactance

Q34. The SI unit of conductivity is:
A. Ω·m
B. S/m
C. Ω
D. H

Q35. The resistance of a metallic conductor generally:
A. Decreases with increase in temperature
B. Increases with increase in temperature
C. Remains constant
D. Becomes zero

Q36. The emf of a cell is:
A. Always less than its terminal voltage
B. Equal to terminal voltage under all conditions
C. The potential difference across the terminals when no current flows
D. Zero in an open circuit

Q37. Internal resistance of a cell causes:
A. Increase in terminal voltage
B. Voltage drop inside the cell
C. Increase in current
D. Infinite power output

Q38. Cells are connected in series to:
A. Increase current capacity
B. Increase voltage
C. Reduce voltage
D. Reduce resistance

Q39. Cells are connected in parallel to:
A. Increase emf
B. Increase current capacity
C. Decrease current
D. Increase resistance

Q40. Kirchhoff's Current Law (KCL) is based on the conservation of:
A. Energy
B. Charge
C. Momentum
D. Power

Q41. According to KCL, the algebraic sum of currents at a junction is:
A. One
B. Equal to voltage
C. Zero
D. Infinite

Q42. Kirchhoff's Voltage Law (KVL) is based on the conservation of:
A. Charge
B. Energy
C. Resistance
D. Current

Q43. According to KVL, the algebraic sum of voltages around any closed loop is:
A. Equal to current
B. Equal to power
C. Zero
D. Infinite

Q44. Wheatstone bridge is primarily used to measure:
A. Voltage
B. Current
C. Unknown resistance
D. Capacitance

Q45. A Wheatstone bridge is balanced when:
A. All resistances are equal
B. No current flows through the galvanometer
C. Maximum current flows through the galvanometer
D. Supply voltage is zero

Q46. Oersted's experiment demonstrated that:
A. Electric current produces a magnetic field
B. Magnetic field produces electric current
C. Electric field produces heat
D. Voltage produces resistance

Q47. The SI unit of magnetic flux density is:
A. Weber
B. Tesla
C. Henry
D. Ampere

Q48. The direction of magnetic field around a straight current-carrying conductor is determined by:
A. Fleming's Left-Hand Rule
B. Fleming's Right-Hand Rule
C. Right-Hand Thumb Rule
D. Lenz's Law

Q49. According to the Biot–Savart law, the magnetic field produced by a current element is:
A. Directly proportional to the current
B. Inversely proportional to the square of the distance
C. Dependent on the angle between the current element and the observation point
D. All of the above

Q50. The magnetic field at the centre of a circular current-carrying loop is:
A. Zero
B. Maximum
C. Equal to the field outside the loop
D. Independent of current

Q51. Ampere's circuital law relates the magnetic field around a closed path to:
A. Electric flux
B. Electric potential
C. Current enclosed by the path
D. Magnetic flux

Q52. The magnetic field at a distance (r) from an infinitely long straight conductor carrying current (I) is:
A. Directly proportional to (r)
B. Inversely proportional to (r)
C. Inversely proportional to (r^2)
D. Independent of (r)

Q53. The magnetic field inside a long solenoid is:
A. Zero
B. Uniform
C. Circular
D. Non-uniform

Q54. The magnetic field outside an ideal long solenoid is approximately:
A. Maximum
B. Uniform
C. Zero
D. Twice the field inside

Q55. The force experienced by a moving charge in a magnetic field is maximum when the charge moves:
A. Parallel to the magnetic field
B. Perpendicular to the magnetic field
C. Opposite to the magnetic field
D. At an angle of 45°

Q56. The force acting on a moving charge in a magnetic field is known as:
A. Electrostatic force
B. Lorentz force
C. Coulomb force
D. Gravitational force

Q57. A charged particle moving parallel to a uniform magnetic field will:
A. Move in a circular path
B. Experience maximum force
C. Continue in a straight line
D. Stop immediately

Q58. Fleming's Left-Hand Rule is used to determine the:
A. Direction of induced emf
B. Direction of magnetic field
C. Direction of force on a current-carrying conductor
D. Direction of electric field

Q59. The force on a current-carrying conductor is maximum when the conductor is:
A. Parallel to the magnetic field
B. Perpendicular to the magnetic field
C. Inclined at 30°
D. Inclined at 45°

Q60. Two parallel conductors carrying current in the same direction:
A. Repel each other
B. Attract each other
C. Produce no force
D. Produce electric force only

Q61. Two parallel conductors carrying current in opposite directions:
A. Attract each other
B. Repel each other
C. Produce no force
D. Fuse together

Q62. A current-carrying circular loop behaves like a:
A. Capacitor
B. Magnetic dipole
C. Resistor
D. Transformer

Q63. The SI unit of magnetic dipole moment is:
A. $A \cdot m^2$
B. Wb
C. T
D. H

Q64. A moving coil galvanometer is used to detect:
A. High voltage
B. Small electric current
C. Power
D. Frequency

Q65. A galvanometer can be converted into an ammeter by connecting:
A. High resistance in series
B. Low resistance in parallel
C. Capacitor in parallel
D. Inductor in series

Q66. Electromagnetic induction is the phenomenon of:
A. Producing heat by current
B. Producing emf due to changing magnetic flux
C. Producing magnetic field by current
D. Producing resistance by voltage

Q67. Faraday's First Law states that an emf is induced whenever:
A. Current flows in a conductor
B. Magnetic flux linked with a circuit changes
C. Resistance changes
D. Voltage becomes zero

Q68. According to Faraday's Second Law, induced emf is proportional to:
A. Magnetic field only
B. Rate of change of magnetic flux linkage
C. Current only
D. Resistance only

Q69. Lenz's law gives the:
A. Magnitude of induced emf
B. Direction of induced current
C. Value of resistance
D. Value of magnetic field

Q70. Lenz's law is based on the law of conservation of:
A. Mass
B. Charge
C. Energy
D. Momentum

Q71. Self-induction is the property of a coil by which:
A. It opposes the change in its own current
B. It stores electric charge
C. It increases resistance
D. It decreases voltage

Q72. The SI unit of inductance is:
A. Tesla
B. Henry
C. Weber
D. Farad

Q73. Mutual induction takes place between:
A. Two capacitors
B. Two magnetically coupled coils
C. Two resistors
D. Two batteries

Q74. The RMS value of an alternating current is equal to:
A. Peak value
B. Average value
C. Effective value producing the same heating effect as DC
D. Half of the peak value

Q75. For a sinusoidal waveform, the RMS value is:
A. Im
B. Im/2
C. Im/$\sqrt{2}$
D. $\sqrt{2}$ Im

Q76. The opposition offered by an inductor to alternating current is called:
A. Resistance
B. Inductive reactance
C. Conductance
D. Capacitance

Q77. Inductive reactance is given by:
A. $XL = 2\pi fL$
B. $XL = 1/(2\pi fL)$
C. $XL = IR$
D. $XL = R/L$

Q78. Capacitive reactance is given by:
A. $XC = 2\pi fC$
B. $XC = 1/(2\pi fC)$
C. $XC = IR$
D. $XC = L/C$

Q79. The total opposition offered by an AC circuit to the flow of current is called:
A. Resistance
B. Reactance
C. Impedance
D. Conductance

Q80. The SI unit of impedance is:
A. Henry
B. Farad
C. Ohm
D. Tesla

Q81. Resonance in a series LCR circuit occurs when:
A. XL > XC
B. XC > XL
C. XL = XC
D. R = 0

Q82. At resonance, the impedance of a series LCR circuit is:
A. Maximum
B. Equal to resistance only
C. Infinite
D. Zero

Q83. The power factor of a purely resistive AC circuit is:
A. 0
B. 0.5
C. 1
D. 2

Q84. Wattless current is drawn by a:
A. Purely resistive circuit
B. Purely inductive or capacitive circuit
C. Heater
D. Incandescent lamp

Q85. An AC generator converts:
A. Electrical energy into heat energy
B. Mechanical energy into electrical energy
C. Chemical energy into electrical energy
D. Electrical energy into mechanical energy

Q86. A transformer works on the principle of:
A. Self-induction
B. Mutual induction
C. Electrostatic induction
D. Coulomb's law

Q87. Electromagnetic waves are:
A. Longitudinal waves
B. Transverse waves
C. Mechanical waves
D. Sound waves

Q88. Which electromagnetic wave is commonly used in television and radio communication?
A. X-rays
B. Radio waves
C. Gamma rays
D. Ultraviolet rays

Q89. Infrared radiation is mainly used for:
A. Medical imaging
B. Remote controls and thermal sensing
C. Nuclear research
D. Sterilization

Q90. X-rays are widely used for:
A. Cooking food
B. Medical diagnosis
C. Radio broadcasting
D. Power transmission

Q91. The energy gap of a semiconductor is:
A. Zero
B. Very large
C. Intermediate between conductor and insulator
D. Infinite

Q92. Silicon is an example of:
A. Conductor
B. Semiconductor
C. Insulator
D. Superconductor

Q93. Doping pure silicon with phosphorus produces:
A. Intrinsic semiconductor
B. p-type semiconductor
C. n-type semiconductor
D. Insulator

Q94. In a p-type semiconductor, the majority charge carriers are:
A. Electrons
B. Holes
C. Protons
D. Neutrons

Q95. A p-n junction diode conducts heavily when it is:
A. Reverse biased
B. Forward biased
C. Unbiased
D. Short-circuited

Q96. The primary application of a rectifier diode is:
A. Voltage amplification
B. Conversion of AC into DC
C. Frequency modulation
D. Power factor correction

Q97. The main purpose of electrical standards and specifications is to ensure:
A. Higher electricity bills
B. Safety, reliability and uniformity
C. Increased conductor resistance
D. Reduced voltage only

Q98. Good lighting design aims to provide:
A. Maximum brightness only
B. Uniform illumination with minimum glare
C. Coloured lighting only
D. Minimum number of lamps irrespective of illumination

Q99. Transformer oil is mainly used for:
A. Lubrication only
B. Cooling and insulation
C. Increasing output voltage
D. Reducing frequency

Q100. Before rescuing a person receiving an electric shock, the first action should be:
A. Touch the victim immediately
B. Disconnect the electrical supply safely
C. Pour water on the victim
D. Pull the victim with bare hands

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