



**Syllabus for examination for selection to the post of
Tech Gr III /Welder**

Part 1: General Knowledge

- 1.1 Important National & International Events, Authors, Places & Personalities etc
- 1.2 Sports
- 1.3 "Who's Who"
- 1.4 Facts about Indian Railways & its Organization, Important events in Indian Railways
- 1.5 Current Affairs

Part-2: English

- 2.1 Antonyms and Synonyms
- 2.2 Tenses, Modals, Determiners, Prepositions
- 2.3 Active and Passive Voice
- 2.4 Direct and Indirect Speech

Part-3: Mathematics

- 3.1 Algebra
 - 3.1.1 Number System
 - 3.1.2 Basic Algebra
 - 3.1.3 Quadratic Equations
- 3.2 Arithmetic
 - 3.2.1 Problems based on age, time, work, and money
 - 3.2.2 Profit & Loss
 - 3.2.3 Simple and Compound Interest
 - 3.2.4 Ratio and Proportion
- 3.3 Triangles
 - 3.3.1 Area
 - 3.3.2 Pythagoras' Theorem
 - 3.3.3 Angle Sum Property, Exterior Angle Property
- 3.4 Area and Volume
 - 3.4.1 Areas Related to Square, Rectangle, Triangle, Circles, Parallelogram, and Area of Sector
 - 3.4.2 Volume of Cylinder, Cube, Cuboid, Cone, etc.

Part 4: General Science

- 4.1 Matter in Our Surroundings: Physical Nature of Matter, Characteristics of Particles of Matter, States of Matter, Mixture, Solution, Concentration of a Solution, Compound
- 4.2 Atoms, Molecules and Chemical Reactions, Structure of the Atom, Valency, Atomic Number, Isotopes, Isobars, Laws of Chemical Combination, Chemical Equations, Types of Chemical Reactions, Oxidation and Reduction, Acids, Bases and Salts, Names of the Salts and Compounds
- 4.3 Metals and Non-metals (Physical Properties, Chemical Properties), Ores of Metals, Corrosion and its prevention

- 4.4 Force and Laws of Motion: Motion Along a Straight Line, Uniform Motion and Nonuniform Motion, Speed with Direction, Acceleration, Equations of Motion, Uniform Circular Motion, Balanced and Unbalanced Forces, Laws of Motion
- 4.5 Work and Energy: Scientific Conception of Work, Forms of Energy, Potential Energy, Potential Energy of an Object at a Height, Law of Conservation of Energy, Power, Method of Heat Transfer
- 4.6 Light – Reflection and Refraction, Spherical Mirrors, Sign Convention for Reflection by Spherical Mirrors, Refractive Index, Refraction through a Rectangular Glass Slab & Prism, Atmospheric Refraction, Refraction by Spherical Lenses, Image Formation by Lenses, The Human Eye, Dispersion of White Light by a Glass Prism

Part-5: Establishment Rules

- 5.1 Pass Rules
- 5.2 Leave Rules
- 5.3 Payment of Wages Act
- 5.4 Hours of Employment Regulations
- 5.5 D&AR (Disciplinary & Appeal Rules)
- 5.6 Workmen's Compensation Act
- 5.7 Factory Act
- 5.8 Basic Knowledge about HRMS, RESS, HIMS, and NPS web portals/App

Part-6 राजभाषा

- 6.1 संघ की राजभाषा नीति का सामान्य परिचय
- 6.2 राजभाषा अधिनियम 1963
- 6.3 राजभाषा संशोधन नियम 1976
- 6.4 राजभाषा संकल्प 1968
- 6.5 राजभाषा से संबन्धित वार्षिक पाठ्यक्रम एवं प्रचलित शब्दावली

Part-7 Professional Knowledge

- 7.1 Different types of Welding Processes & power sources
 - 7.1.1 Shielded Metal Arc Welding process (SMAW) and its application.
 - 7.1.2 GAS Metal Arc Welding process (GMAW) and its application.
 - 7.1.3 Metal Inert Gas Welding (MIG) & its application.
 - 7.1.4 Metal Active Gas Welding (MAG) & its application.
 - 7.1.5 Tungsten Inert Gas Welding (TIG) & its application.
 - 7.1.6 Oxy-acetylene cutting process.
 - 7.1.7 Air Plasma cutting process
 - 7.1.8 Knowledge about various power sources used in different types of welding.
 - 7.1.9 Welding processes used during maintenance of various Rolling Stocks used in Railways.
 - 7.1.10 Different types of tools used during welding processes.
 - 7.1.11 Knowledge about Cold Cutting Process used in Railways.
- 7.2 Safety Precautions & PPE's used
 - 7.2.1 Safety in Welding
 - 7.2.2 Safety in Flame Cutting
 - 7.2.3 PPE's item used during various welding processes.
- 7.3 Welding Joints and edge preparation
 - 7.3.1 Type of Welding Joints
 - 7.3.2 Edge preparation for various type of welding joints
 - 7.3.3 Welding Symbols.

- 7.4 Welding defects- causes and remedies.
 - 7.4.1 Various type of welding defects and their causes
 - 7.4.2 Welding distortion- causes and remedies.
 - 7.4.3 Precautions/ remedies used during process for various welding defects
- 7.5 Welding Inspection
 - 7.5.1 Visual Inspection
 - 7.5.2 Various NDT methods for welding inspection
 - 7.5.3 Various DT methods for welding inspection
- 7.6 General
 - 7.6.1 Basic Professional knowledge of Machinist, Black smithy, Fittings, Painting, Carpentry, Foundry, Millwright, Diesel Fitter Theory, Use of Measuring Tools, Lifting and Handling Devices, Tool & Template, Hand tools, general purpose tools, special purpose tools, jig and fixtures, Heat Treatment, etc
 - 7.6.2 Types of bolts and nuts: hex bolts, carriage bolts, and eye bolts, hex nuts, lock nuts, and wing nuts
 - 7.6.3 Basic Knowledge of Electrical Parameters
 - 7.6.4 Basic knowledge of ferrous & non-ferrous metals
 - 7.6.5 Reading of Drawings
 - 7.6.6 Material Specifications, Properties, Bearings, Lubricants, and Drives
 - 7.6.7 Knowledge and operations of machines
 - 7.6.8 Knowledge of Different Types of coaches, wagons & bogies
 - 7.6.9 Familiarisation with components of coach, wagon & Bogies, and Passenger Information System (PIS)
 - 7.6.10 Knowledge of Air Brake System of wagon & coaches
 - 7.6.11 Organizational chart, PCO organization, and functioning of its various sections
 - 7.6.12 Incentive scheme
 - 7.6.13 Industrial Safety, Fire Safety, Housekeeping, and First Aid
 - 7.6.14 Basic knowledge of computers (MS Word, Excel)
 - 7.6.15 Basic Knowledge of CNC Machines
 - 7.6.16 Knowledge of hazardous work and its disposal

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