



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

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 Marking, Measuring and Hand Tools
 - 7.2.1 Knowledge about various marking tools and their uses.
 - 7.2.2 Knowledge about various measuring tools and their uses.
 - 7.2.3 Types of Hand Tools used in Machine Shop
- 7.2 Precision Measuring Instruments , Gauges & Template
 - 7.3.1 Various Types of Precision Measuring Instruments and their application.
 - 7.3.2 Various types of Gauges used in Machine Shop.
 - 7.3.3 Introduction of Template used in Machine Shop.
- 7.3 Cutting Tools, Jig & Fixture, Interchange ability,
 - 7.4.1 Types of Cutting Tools used and their application
 - 7.4.2 Knowledge of Heat Treatment used on Cutting Tools.
 - 7.4.3 Interchange ability and its application in Mass Production.
 - 7.4.4 Introduction to Jig & Fixture
 - 7.4.5 Knowledge about Limit, Fit & Tolerance

7.4 Machining Processes and Machines

- 7.4.1 Various types of Lathe Machines & Machining operation like turning, planing, shaping, slotting, threading etc. on Lathe Machines
- 7.4.2 Knowledge about Planner and Shaper Machine and their uses.
- 7.4.3 Knowledge about Various Drilling & Boring Machines.
- 7.4.4 Types of Milling Machines and their uses.
- 7.4.5 Types of Grinding Machines and their uses
- 7.4.6 Introduction to Lapping Machines.
- 7.4.7 Knowledge about Wheel Lathes, Wheel Profile.

7.5 Basic Knowledge of CNC Machines

7.6 Lubricant & Coolants

- 7.6.1 Knowledge about Lubricants and various Lubrication process used.
- 7.6.2 Introduction to various types of coolants used in various machining processes.

7.7 Safety Precautions

- 7.7.1 Safety precautions during working in Machine Shop

7.8 General

- 7.8.1 Basic Professional knowledge of Welder, Black smithy, Fittings, Painting, Carpentry, Foundry, Millwright, Diesel Fitter Theory, Lifting and Handling Devices, , general purpose tools, special purpose tools, etc.
- 7.8.2 Types of bolts and nuts: hex bolts, carriage bolts, and eye bolts, hex nuts, lock nuts, and wing nuts
- 7.8.3 Basic Knowledge of Electrical Parameters
- 7.8.4 Basic knowledge of ferrous & non-ferrous metals
- 7.8.5 Reading of Drawings
- 7.8.6 Material Specifications, Properties, Bearings, Lubricants, and Drives
- 7.8.7 Arc Welding, Gas Welding & Cutting
- 7.8.8 Knowledge of Different Types of coaches, wagons & bogies
- 7.8.9 Familiarisation with components of coach, wagon & Bogies, and Passenger Information System (PIS)
- 7.8.10 Knowledge of Air Brake System of wagon & coaches
- 7.8.11 Organizational chart, PCO organization, and functioning of its various sections
- 7.8.12 Incentive scheme
- 7.8.13 Industrial Safety, Fire Safety, Housekeeping, and First Aid
- 7.8.14 Basic knowledge of computers (MS Word, Excel)
- 7.8.15 Knowledge of hazardous work and its disposal

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