PLW/PATIALA

Syllabus For Examination for the Post of Junior Instructor/ MW Electrical In TTC

A. Role of Senior Supervisors & Managerial Skill: Role of supervisors, Leadership, Intrinsic Motivation, Inter Departmental Cooperation and Team work etc.
B. General Knowledge & Maths: Current affairs, who is who, Maths upto level of 10th standard.
C. Labour Laws, Personnel and Finance Matters: Establishment rules, Leave Rules, Pay and Allowance, Pension Scheme and PF Rules, Pass Rules, Hours of Employment Regulation, Railway Services (Conduct) Rules 1966, Railway Servant (Discipline and Appeal) Rules 1968 (DAR Rules). The Factories Act1948. The Water (Prevention and Control of Pollution) Act 1974, Air (Prevention and Control of Pollution) Act1981. Fire safety and protection in factories, disaster management various types of incentive schemes etc. Various type of plan Heads and programmes. Budgets allotments, salary, Night duty allowance, over time allowance, gate attendances, biometrics attendances etc. Various types of salary allowances and deductions etc. Basic knowledge on Railway Codes and manuals, RSP, Plan head and M&P programs etc.
D. Material Management: Consumables & Imprest stores, stock verification, stock and non-stock items, material procurement including inspection, passing of stores bills, Surplus stores & its disposal including scrap and ABC analysis in inventory management etc. Basic knowledge for working on HRMS, IREPS, UDM, MMIS and e-Office etc.
E. Basic knowledge of computer, Various terminologies used, Role of computers in daily life, advantages and resources on the Web etc.
F. Trade Theory:

1.0	**Safety, Standards, and Workplace Readiness** Electrical safety basics: Shock, arc-flash principles, first aid, shock pathways Lockout/Tagout (LOTO) and isolation verification Safe work at height and in confined spaces (where applicable) Tool safety, test instrument handling, and safe test practices Reading and applying standards Risk assessment and method statements
2.0	**Electrical Fundamentals for Millwrights** AC/DC basics: RMS, power, power factor, frequency Single-phase vs three-phase circuits Transformers: operation, ratings, connections (Δ/Y), voltage regulation basics Motor basics: torque concept, efficiency, typical motor types used in industry Electrical symbols and schematics: ladder logic symbols, single-line diagrams Basic instrumentation concepts: measurement categories and limitations
3.0	**Motor Control Systems** Motor starters: direct-on-line (DOL), star-delta, soft starters (overview), VFD concepts Control circuits vs power circuits (how to separate and trace them) Contactors, overloads, relays: function, typical faults Interlocks, permissives, emergency stop (E-Stop) chains Control power supplies (24V/110V/230V/240V as applicable) Typical motor control wiring layouts and documentation practices Commissioning fundamentals: what to verify before energizing

4.0	**Protection, Distribution, and Power Quality (Industrial Focus)** Circuit protection devices: fuses, MCBs, MCCBs, protective relays Grounding/earthing: protective earth, bonding, continuity testing concepts Insulation resistance testing and interpretation RCD/ELCB/RCBO basics (application and limitations) Overcurrent, earth fault, short-circuit basics Power factor correction basics Basic harmonics awareness and why they matter (especially with VFDs/rectifiers)
5.0	**Cabling, Termination, and Panel/Wiring Practices** Cable types and selection basics (power, control, instrumentation) Cable glands, strain relief, segregation concepts Crimping/terminations: Correct practices and common failure modes Panel wiring standards: Labelling, documentation, wire management Earthing/bonding in panels Incoming/outgoing termination verification Cable testing essentials: Continuity, insulation, polarity (as taught)
6.0	**Sensors, Instrumentation, and Control Inputs** Proximity sensors, photoelectric sensors, float switches (where relevant) Limit switches and safety switches (basic function & wiring) 4–20 mA and voltage signalling basics Analog vs digital inputs: Failure modes and troubleshooting approach Encoder inputs basics (overview for maintenance roles) Common industrial sensor wiring errors and how to detect them
7.0	**Electromechanical Systems Integration** Couplings, alignment basics (why electrical trips can be mechanical causes) Motor noise/heat indicators and what they might indicate Vibration/condition monitoring concepts How to coordinate electrical + mechanical troubleshooting Common misdiagnoses and how to avoid them
8.0	Air compressors and EOT crane maintenance.

G. Knowledge of Various ISO certifications in PLW, like TS/ISO-22163, ISO 14001, ISO-45001, ISO -50001 etc. Commonly used BIS standards in Railways.

H. संघ की राजभाषा और नियम का सामान्य परिचय, राजभाषा अधिनियम 1963 राजभाषा नियम 1976, राजभाषा पुरष्कार, भारतीय संविधान की आठवीं अनुसूची में सम्मिलित भाषाए।

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