

DETAILED SYLLABUS OF PART A

Particulars	Syllabus - General (Part A)
General Knowledge	<ul style="list-style-type: none"> • Facts about India and other countries: Basic facts / Geography / Tourism / Transport systems / Personalities / Places / History / Constitution / Economy / Writers / Literatures / Indian States & Union Territories / International Organizations. • General Science : Branches of studies / Scientific instruments and appliances / Physics / Chemistry / Biology • Sports & Games • Important Events/ Movements / Leaders / Places / Years • Writers – Authors – Biography - Autobiography • Abbreviations
General English	<ul style="list-style-type: none"> • Spotting Errors / Vocabulary usage / Sentence Completion / Synonyms / Antonyms / Reconstruction of sentences / One word substitution / Idioms & Phrases / Grammar / Correct usage of Articles / Prepositions / Singular and Plural
Reasoning	<ul style="list-style-type: none"> • Analogy / Classification / Series Completion / Coding-Decoding / Blood Relation / Direction Sense Test / Alphabet Test / Number and Ranking / Puzzle Test / Odd Man out / General Intelligence
Quantitative Aptitude	<ul style="list-style-type: none"> • Number system / Fraction and Decimals / Simplification / Volume and surface areas / Square roots and Cube roots / Problems based on numbers, Speed, Time and Distance, Simple Interest / Compound Interest / Boats and Streams / Problems on Trains / Percentage - Interest / HCF and LCM / Average / Ratio and Proportion / Time and Work / Problems based on ages / Profit, Loss and Discount, Statistics / Permutations & Combinations / Probability.

DETAILED SYLLABUS OF PART B

Post Code	Name of Post	Syllabus - Discipline related (Part B)
A1 to A4	Junior Technical Assistant [Mechanical, Electrical, Electronics, Civil]	<u>Attached as Annexure II</u>
A5	Junior Commercial Assistant	<ul style="list-style-type: none"> • Office procedures, office correspondence, • Record keeping and maintenance of files, Act and Regulations, • Use and application of computer in office, Data entry, computer network, computer devices, operating systems, Windows, MS Word, MS Excel, • Computer maintenance, • Office stationery, paperless office, • ERP, • Duties and responsibilities of Commercial Assistants, • E-commerce, • Environment, • Communicative English, • Business Communication, • Accountancy, • Desktop Publishing, • Data storage, • Cyber security
A6	Store Keeper	<p><u>Theoretical and application knowledge on</u></p> <p>A. <u>Stores /Warehouse Management</u></p> <ul style="list-style-type: none"> • Objectives , Functions & responsibilities of Store keeping • Types of Stores • Storage Systems & Layout • Store Management Functions - processes and procedures • Storage of hazardous materials and its management • Category Management- classification and codification • Stock Verification Methods • Material Handling Methods and Equipments • Importance of Documentation <p>B. <u>Inventory Management</u></p> <ul style="list-style-type: none"> • Functions of inventory • Classification of inventory • Costs associated with inventory • Inventory control methods (like ABC, FSN, VED analysis etc) <p>C. <u>5S Methodology of housekeeping</u></p> <ul style="list-style-type: none"> • Objectives and importance • 5S in practical applications <p>D. <u>Computer Literacy, MS Office & E-mail</u> (2007 & higher versions)</p> <ul style="list-style-type: none"> • Windows Basics

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		<ul style="list-style-type: none"> • MS Excel Basics • MS Word Basics • Email – basics and applications <p>E. <u>ERP – Basics</u></p> <ul style="list-style-type: none"> • Objectives and importance • Functions • Different ERP Systems like SAP and relevant modules with reference to material procurement <p>F. <u>ISO 9001, 14001 & OHSAS 18001</u>- Objectives and importance</p> <p>G. <u>Customer Relationship Management in stores</u> – Basics, Objectives and importance, Applications</p>
A7	Welder Cum Fitter (Mechanic Diesel)	<p><u>Theoretical and application knowledge on</u></p> <ul style="list-style-type: none"> • Tools - Bench wise/Files etc • Marking and measuring tools • Limits/Fits/Tolerance • Numerical ability – Mass/Volume/Density/unit conversion/unit system • Shaft alignment • Erection & commissioning of equipments • Valve timing/Tappet clearance • Decarbonising • Fasteners and torque tightening • Engine systems • Engine type and functions • I/C Engines and its parts • Types of bearings and its uses • Safety procedures /First aid • Types of material handling equipments
A8	Fitter (Electronics)	<p><u>Theoretical and application knowledge on</u></p> <ul style="list-style-type: none"> • Difference between conductor, insulator and semiconductor • RC, LC and RLC circuits. • Symbols , working principle and applications of various electronic components like diode, transistor, zener diode, ,SCR,UJT,FET, Diac, Triac, MOSFET,IGBT. • Half wave and full wave rectifier circuit , Filter circuits and Ripple factor. • Single stage and multi stage amplifier and types of signal. • Boolean Algebra, Logic Gates, Truth tables and Flip Flops • Fundamentals of DC motor, slip ring and squirrel cage induction motor • Speed control of AC/ DC Motors • DOL ,star delta and Soft starters • Concept of DC drives and AC drive(VFD) • PLC and ladder logic basics, Microprocessor controls & I/O Devices

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		<ul style="list-style-type: none"> • Concept of CCTV and Networking • Power supply, SMPS and UPS • Navigation and Communication Equipments: <ul style="list-style-type: none"> ➤ GMDSS, Gyro compass, Radar, Echo sounder, GPS and DGPS, Doppler log, AIS, Steering control(Autopilot),various types of Antennas and Band of Frequencies. ➤ PA system, Talk back system, EPABX • Fire alarm system – Conventional and Addressable types • Testing/Measuring Instruments like Oscilloscope, Function generator ,Spectrum analyzer, Tachometer, Tong Tester and Megger • Calibration of measuring instruments like Voltmeter, Ammeter, KW meter ,Power Factor meter, KWH meter, insulation meter • Battery chargers and Batteries, Serviceability checks &Capacity test of batteries. • ICCP controls ,Anodes and Reference Electrodes • Dynamic Positioning systems. • DA/AD converters • Different types of Proximity switches ,Level switches, Pressure switches &transmitters • Photo diodes and photo transistors, RTD's and Thermocouples • Tacho generators and Encoders • Need of modulation and de-modulation, Type of modulation ,Radio transmitter and receiver • Advantages of FM over AM • SSB receivers. • Satellite communication and micro-wave communication • Positive and Negative Regulators using IC's • Oscillators, PLL's and Synthesizers • Op-Amps using IC 741 • Timers using IC555 • LCD/LED Displays • TV Receivers and HD systems. • Dish TV systems • Electronics in Welding sets • Various braking systems used in cranes • Speed control of LLTT cranes • Requirement of AVR's in Alternators • Safety measures while handling Electrical and Electronics equipments. • Soldering and De-Soldering Techniques
A9	Fitter (Electrical)	<p><u>Theoretical and application knowledge on</u></p> <p><u>Fundamentals of electricity:</u> various laws of electricity and its applications, Basic electrostatics & electro dynamics, primary and secondary cells, magnetic and</p>

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		<p>capacitive circuits, power and power factor, polyphase system, measuring instruments, measurement of power and energy.</p> <p><u>Electrical appliances and wiring:</u></p> <ul style="list-style-type: none"> • domestic appliances- lighting, various types of lamps, wiring circuits • domestic and industrial, earthing, regulated power supply, maintenance of domestic appliances, IEE rules. <p><u>Electrical machines:</u> D.C generators & DC motors- characteristics and applications, speed control and testing, transformers& autotransformers- losses and testing, alternators, single phase& 3 phase motors, starter and internal connection diagrams.</p> <p><u>Basic electronics:</u> active and passive electronic components, rectifier circuits, characteristics of transistors, amplifiers, OPAMP, oscillators, types and application of SCR,UJT, TRIAC, DIAC, microprocessor etc, digital electronics.</p> <p><u>Winding of machines:</u> fundamental terms used in windings, winding of transformers, motors, armature winding, material used, and method of connection.</p> <p><u>Electrical Switchgear:</u> principle, operation & application of Fuses, MCCB, Protective relays, ELCB.</p> <ul style="list-style-type: none"> • safety for handling electrical equipments/ wiring/ applications • statutory requirements while handling electrical applications
A10	Shipwright Wood	<p><u>Theoretical and application knowledge on</u></p> <p>Wood working terminologies – Wood working machineries (portable & stationary) – its application & routine maintenance. Various hand tools- measuring instruments for wood working and its relative advantages – Wood preservation & seasoning- Timber identification – Defects in timber – Understanding measurements & tolerances – Knowledge of various wood working joints, furniture fabrication appropriate application and their relative merits & demerits – Knowledge of laminate material, hardware items, & its relative merits – Application of adhesives & finishing agents – Knowledge of modern modular assembly & interior architects and model developments & docking including block setting in marine field (Both new building projects & repair).</p> <ul style="list-style-type: none"> • <u>Industrial Safety</u> <p>Awareness on Safety & PPEs - Importance of house keeping</p>

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A11	Semi Skilled Rigger	<p><u>Theoretical and application knowledge on</u></p> <ul style="list-style-type: none"> • <u>Rigging Procedures and Practices</u> – Types of loads and its lifting ,Measuring units, sign boards, lifting drawing / symbols , Tag Lines, Lifting Points, Types of lifting slings / ropes , Rope Reeving, knots and splicing. • <u>Different types of hoist mechanisms</u> • <u>General awareness of Cranes</u> - Different types of Cranes, understanding of crane dynamics including swinging, raising, lowering, stopping loads and boom deflection. • <u>Communication-</u> Hand Signals - Communication using Walkie Talkie. • <u>Lifting Criteria</u> - Centre of Gravity, Effect of sling Angles, Personnel lifting, rope dimensions etc. • <u>Rigging Equipment and accessories</u> - Chain blocks, chain lifters, Jacks, Ropes, belts, slings and other lifting tools & Tackles. • <u>Safety Rules and Measures</u> - Safety associated with all Rigging activities, Hazard identification and its elimination, Emergency procedures, fall protection. • Types of material handling equipments
A12	Fireman	<p><u>Theoretical and application knowledge on</u></p> <ul style="list-style-type: none"> • Basics of Fire, Fire Prevention, Fire Fighting, Salvage • Physics and chemistry of fire • Different types of fires • Indian Standards relating to Fire Fighting Equipments and Appliances • Fire service hydraulics • Plan reading • Passive and Active fire protection systems • Hose and hose fittings • Branches and nozzles • Ladders • Pumps and primers • Portable fire extinguishers construction, performance & maintenance • Foam and foam making branches • Fixed fire fighting installations • Respiratory supporting systems in fire fighting(SCBA, ELSA etc) • MSDS awareness (Hydrocarbons, chemicals) • Storage requirements and classifications for Hazardous goods, Explosives, Petroleum etc • Electricity – Concepts, safety • Different types of extinguishing media. • Practical fireman ship • Automatic Fire detection and alarm systems • First aid, Resuscitation and CPR

Post Code	Name of Post	Syllabus - Discipline related (Part B)
		<ul style="list-style-type: none"> • Sprinklers and drenchers • Basic knowledge on NBC part-IV requirements. • Important rescue tools and its use • Global warming and environmental protection- green house gases, ozone depletion, new technologies in firefighting. • Clean agent fire fighting system – operation, maintenance & salvage.
A13	Junior Safety Assistant	<p><u>Theoretical and application knowledge on</u></p> <ul style="list-style-type: none"> • Safety principles : Hierarchy of controls, Accident triangle, accident Investigation. • Working Conditions : Hot work, Confined space, Work at height management. • PPEs and Safety gadgets : Standards, PPEs for the activities. • Fire : Fire prevention and fire fighting.

Syllabus for Junior Technical Assistant (Mechanical)

1.	Manufacturing Processes	(a) Casting (b) Forging (c) Rolling (d) Extrusion (e) Machining including surface finishing
2.	Welding	(a) Types of welding (b) welding defects (c) Testing of welds (d) Brazing and soldering
3.	Theory of Machines and Machine Design	(a) Fundamentals and types of machines (b) Common mechanisms (c) Cams and followers (d) Common transmissions (e) Flywheels and governors (f) Brakes, dynamometers, clutches and bearings (g) Balancing and vibration
4.	Thermal Engineering	Energy sources Fundamentals of thermodynamics Ideal gasses Steam turbines and condensers Heat Transfer
5.	Applied Mechanics	(a) Forces and moments (b) Friction (c) Centroid and Centre of Gravity (d) Simple machines, pulleys, blocks and wheels (e) Kinetics (f) Kinematics (g) Work, power, energy
6.	Metallurgy and Material Properties	(a) Physical, Mechanical, Thermal, Electrical, Magnetic Properties etc (b) Effect of heat treatment (c) Surface hardness and hardening (d) Corrosion (e) Testing of metals (f) Lubricants and their properties
7.	Strength of Materials	(a) Stress and strain (b) Bending and shear forces (c) Bending and shear stress (d) Moment of Inertia (e) Torsion
8.	Fluid Mechanics	(a) Properties of liquids (b) Fluid dynamics (c) Classification of fluids (d) Laws related with fluid flow and dynamics (e) Turbines
9.	Basic Computer Applications	(a) Hardware and software (b) Operating systems and applications (c) Internet

10.	Basics of Electrical Engineering and Power Generation	<ul style="list-style-type: none"> (a) Electrical power generation, transmission and distribution (b) AC fundamentals (c) Measuring instruments (d) DC motors (e) AC appliances (f) Utilisation of electrical energy (g) Electrical safety
11.	Industrial Management	<ul style="list-style-type: none"> (a) Management process (b) Organisational Management (c) Human resource management (d) Material Management
12.	Metrology and Instrumentation	<ul style="list-style-type: none"> (a) Classification of instruments - range and span, accuracy and precision, reliability, calibration, hysteresis and dead zone, drift, sensitivity, threshold and resolution, repeatability and reproducibility, linearity, speed of response, fidelity and dynamic errors, overshoot. (b) Measurement of error- classification of errors, environmental errors, signal transmission errors, observation errors, operational errors. (c) Transducers : Classification of transducers- active and passive, resistive, inductive, capacitive, piezo, resistive, thermo resistive (d) Specification, selection and application for pressure, temperature, flow, humidity, displacement, velocity, force, strain, sound. (e) Control Systems (f) Measurement of displacement, flow, temperature, strain, miscellaneous. (g) Limits, fits, tolerances and gauges (h) Screw thread measurement (i) Surface finish measurement
13.	Construction and functioning of various machines	<ul style="list-style-type: none"> (a) Pumps (b) Compressors (c) Boilers (d) Turbines (e) IC Engines (f) Purifiers and separators (g) Hydraulic machinery and lifting equipment etc
14.	Refrigeration and Air-conditioning	<ul style="list-style-type: none"> (a) Basics of refrigeration (b) Refrigeration cycles (c) Refrigerants (d) Components of a refrigeration system (e) Air conditioning (f) Air conditioning Systems (g) Air Distribution Systems

Syllabus for Junior Technical Assistant (Electrical)

1.	Basic electrical engineering	(a) Network theorems and laws (b) Magnetic circuits (c) AC fundamentals (d) RLC circuits
2.	Static and rotating AC&DC machines	(a) DC generators (b) DC motors (c) Transformers (d) Synchronous generators (e) Synchronous motors (f) Induction motors (g) Single phase motors
3.	Power system	(a) Generation of electrical power (b) Transmission and distribution (c) Circuit breakers (d) Cables
4.	Electrical measurements	(a) Moving coil instruments (b) Moving iron instruments (c) Measurement of current, voltage, frequency and energy (d) Bridge circuits
5.	Semiconductor Devices	(a) Semiconductors (b) Diodes and power supplies (c) Transistors
6.	Basic Computer Applications	(a) Hardware and software (b) Operating systems and applications (c) Internet

Syllabus for Junior Technical Assistant (Electronics)

1	Circuit Fundamentals	Passive Circuit elements, Ohm's Law, Energy Sources, DC and AC Fundamentals, Tuning Circuits and Filters, Electrostatics, Faraday's Laws and Lenz's laws
2	Solid State Physics	Conductors, Semiconductors and Insulators
3	Active and Passive Devices in circuits, Switching circuits	Resistors, Capacitors, Diodes, Special Diodes, Transistors, FET, Thyristors, DIAC, TRIAC, Optoelectronics Devices, IGBT, switching applications
4	Amplifiers and Oscillators	Single Stage and Multistage Amplifiers, Feedback amplifier, Sinusoidal and non-sinusoidal Oscillators
5	Integrated Circuits and Logic Gates	Basic gates and equivalent circuits, Adders, Subtractors, Op-Amp, Flip Flops
6	Transducers	Hall Effect, Classification/Types and working- LVDT, proximity sensors, piezoelectric transducers, working of Load cell
7	Electronic Instruments	Analog and Digital Instruments, Multimeter, Voltmeter, Ammeter, CRO
8	Power Supplies	Unregulated and Regulated Power Supply, Rectifiers, SMPS, UPS
9	Number Systems, Boolean Algebra	Decimal and Binary number systems- Conversion problems, Laws of Boolean Algebra
10	Digital Circuits and Microprocessors	Digital logic families:TTL, MOS, Combinational circuits: multiplexer/ demultiplexer, encoder/ decoder, adder/subtractor, comparator, counters and parity generators; Sequential circuits: latches and flip-flops (RS, JK, D, T, and Master Slave); Registers; Counters: ripple, ring, and shift register counters; PLC- working with sensor and actuators, PLC programming, Microprocessors: 8085 and 8086, Ladder Diagram, RAM, ROM, Choppers , Inverters and Cycloconverters.
11	Principles of Communication	Modulation and De-modulation types, FSK, PSK, TDMA, FDMA, CDMA. Electromagnetic Spectra, Basic principles of Fibre Optic communication
12	AV Systems	Microphones, Loudspeakers, Stereo system, Dolby system, Tuners, IF and RF Amplifiers, Digital TV, CCTV, Frequency, Phase and Amplitude Distortion, Mixers, audio-video formats
13	Ship Communication Equipments	GMDSS, marine VHF, RADAR, INMARSAT Equipment, Antennas in ship
14	Basic Electricals	AC and DC fundamentals, Basic working of AC and DC motors-classification, Transformers, AC/ DC motor speed control techniques, Basic working principle of Generators, Alternator, Rectifiers and invertors, Star and delta starters
15	Energy Conservation	Renewable sources of energy, VFD for industrial use
16	Basic Computer Applications	Hardware and software, Operating systems and applications, Internet

Syllabus for Junior Technical Assistant (Civil)

1	Surveying	Chain surveying – principles, instruments, ranging, and chaining survey lines, field work and field book, selection of survey stations, units of land area.
2	Levelling	Levelling instruments, different types, bench mark, reduced level of points, booking of field notes, reduction of levels by height of collimation method. Modern survey – instruments – Total station, Electronics theodolite.
3	Materials	Brick – varieties and strength, characteristics of good brick. Cement – varieties and grade of cement and its uses. Steel – types of steel for reinforcement bars, steel structural sections. Aggregates – types & requirements of good aggregates. Concrete – grades of concrete as per IS code, water cement ratio, Workability, mixing, batching, compaction and curing.
4	Masonry	Classification-Stone masonry-Brick masonry-Laterite masonry-composite masonry. Different types of stone masonry-General principles and specifications for stone masonry.
5	Brick masonry	Different types of bonds for walls, piers and junctions of walls for equal and unequal thickness-English, Flemish (Single and Double Flemish)-Specification for brick masonry as per relevant codes. Hollow block masonry, Solid block masonry and inter locking block masonry. Types and methods of construction-Advantages and Disadvantages with reference to other types of masonry.
6	Damp proof courses	Definition of dampness-causes and effects-methods of prevention-surface treatment-internal/external water proofing courses.
7	Form work	Functions-materials used- Requirements of good form work-Scaffolding, Shoring Definition-purpose and function-Requirements-materials used
8	Plastering and Pointing	Materials and proportion-Functions-general specifications-types Different components of building from foundation to roof and their functions
9	Foundations	Functions, Classification, Shallow- Deep, Types-Spread footing-raft-mat-column footing-pile foundation-well foundation, bearing capacity.
10	Flooring	Requirements of a good floor, materials used for flooring, Floor finishes-Types Mosaic, Marble, Granite, Ceramic tiles, Vitrified tiles, Glass, Wooden, and other types of modern floor finishes
11	Simple stresses and strains	Types of stresses-Elasticity-Hook's law-Young's modulus-Elasticity, stiffness, plasticity, toughness, brittleness, ductility, Malleability and hardness-Linear strain and lateral strain-Poisson's ratio-volumetric strain-Bulk modulus-modulus of rigidity

12	Beams and bending	Classification of beams–cantilever, simply supported, fixed, overhanging and continuous. Types of loading– concentrated, uniformly distributed and uniformly varying load. Shear force and bending moment–definition and sign conventions. Calculation of SF and BM for Cantilever, simply supported and overhanging beams and sketching of SF and BM diagrams (for point load, uniformly distributed load, uniformly varying load and combinations of u.d.l and point loads) Relation between SF and BM.
13	Carpentry	Carpentry material-timber-structure, classification-soft wood, hard wood-carpentry tools marking and measuring tools, cutting tools, boring tools, striking tools, holding tools Carpentry processes-marking, sawing, planing and chiseling
14	Tender and Tender notices	Necessity of tenders – sealed tenders – tender notice, tender document – Earnest money and security deposit – opening of tenders – scrutiny of tenders – comparative statements – selection of contractors – negotiation, acceptance of tender, work order – contract agreement – conditions of contract. Type and characteristics of Contracts and Tenders.
15	Measurement of Works	Measurement book – Rules to be followed in recording measurements – pre-measurements and check measurements – contractor’s acceptance of measurement.
16	Payment of Bills	Types of bills – first and final bills – preparation of bills –running account bills – modes of payment – checking of bills –recoveries to be made from bill – mobilization advance- secured advance- liquidated damages - penalty
17	Construction Machinery	Earth moving equipments , Concrete Machinery , concrete mixers , ready mix plants, compaction machinery, vibrators ,Lifting and hoisting machineries ,pumps ,general civil engineering tools
18	Principles of Safety in Construction	Causes, effects and prevention of accidents, safety practices in construction – Site Engineers / Supervisor’s role – safety through legislation – precautions during handling of materials occupational hazards and basic guidelines for safety in construction industry.
19	Estimation	Data Required for Preparation of an estimate, Type of Estimate, Detailed and abstract estimate, Analysis Of Rates , Detailed estimate preparation for a single/two storied building (residential and office) with Septic Tank , soak pit , RCC roof and steel roof truss. Detailed estimate of RCC beam, slab, column etc and preparation of bar bending schedule. Detailed specifications for various items of work of Earth work excavation, Foundation concrete, Masonry work, DPC, Form work, RCC, Plastering, Pointing, Flooring, Painting and Polishing.

Annexure II - JTA

20	Docks and Harbours	Wharves, Jetty, Dolphins, fenders, docks, Uses of wet docks and Dry docks, break waters , aids to navigation, dredging methods, Major Ports in India, Major shipyards in India.
21	General	Kerala building rules, computer software's in civil engineering, units, conversions, Statutory requirements for Coastal zone constructions , Pollution Control Board
22	Basic Computer Applications	Hardware and software, Operating systems and applications, Internet