

SYLLABUS FOR RECRUITMENT OF WORKPERSONS IN OIL-RAJASTHAN FIELD

ADVERTISEMENT NO. RF/HRA/04/ER/REC/2025 dated 10.09.2025

SECTION A: English Language & General Knowledge/ Awareness and Questions on Oil India Limited (Common for All Posts)

- General English: Vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, Sentence Correction, Direct & Indirect Speech, Active & Passive Voice, etc.
- General Knowledge: India and its Neighbouring countries, Sports, History, Culture, Geography, Economic Scene, General Polity including Indian Constitution, and Scientific Research, Current Events, Questions on Oil India Limited, Questions on Rajasthan.

SECTION B: Reasoning, Arithmetic/ Numerical and Mental Ability (Common for All Posts)

- Reasoning: Analogies, Similarities and Differences, Space Visualization, Problem Solving, Analysis, Judgment, Decision Making, Visual Memory, Discriminating Observation, Relationship Concepts, Verbal and Figure Classification, Non-Verbal Series, etc.
- Arithmetic/ Numerical Ability & Mental Ability: Arithmetical Reasoning, Arithmetical Number Series, Arithmetical Computation, Percentage Problems, Fractions, Time & Work, Distance & Speed, Permutations & Combinations, Data Interpretations, Ratio & Proportion, Areas & Volumes, Mensuration, etc.

SECTION C: Domain or Relevant Technical Knowledge

POST: RFJAC12025

- English Knowledge: Active and Passive Voice, Prepositions, Spotting Errors, Homophones, Identify the Sentences, Substitution, Spelling Test, Passage Completion, Adjectives, Nouns, Transformation, Joining Sentences, Articles, Sentence Pattern, Sentence Completion, Tag Questions, Para Completion, Sentence Arrangement, Error Correction (Underlined Part), Error Correction (Phrase in Bold), Fill in the blanks, Idioms and Phrases, Tense, Sentence Improvement, Gerunds, Identify the Errors, Odd Words, Plural Forms, Prefix & Suffix, etc.
- Computer Knowledge: The questions on Basic Computer Knowledge, Characteristics of Computers, Computer Organisation including RAM, ROM, File System, Input Devices, Computer Software including Relationship between Hardware and Software, Operating System, MS-Office (exposure of Word, Excel/Spread Sheet, Power Point, etc.), Information Technology and Society, Indian IT Act, Digital Signatures, Application of information technology in Government for E-Governance, Mobile/Smartphones, Information Kiosks, Cyber Security, etc.

POST: RFFTR12025

- Importance of safety and general precautions observed in the in the industry/shop floor - First aid, PPEs and Response to emergencies etc. Basics of Hot work, confined space work and material handling equipment.
- Bench Vice, Files – specification, types, uses, care & maintenance. Marking and measuring tools, Marking media, their special application, description.
- Physical & Mechanical properties of engineering metal. Types, properties and uses: Pig Iron, Cast Iron, Steel and Non-ferrous metals (Copper, Aluminum, Tin, Lead, Zinc).
- Power Saw, Band saw, Circular saw machines used for metal cutting.
- Micrometer, Vernier calipers, Dial test indicator – principle, features, parts, reading, use and care.
- Drilling processes - Types, Drill-material, Drill angle, Drill holding devices, Drill troubles: causes and remedy.
- Sheet metal – sheet, sizes, types, uses as per BIS specifications. Shearing machine-description, parts and uses.
- Stakes- types, parts, their uses. Various types of metal joints, Wired edges. Solder and soldering: types of solder and flux.
- Counter sink, counter bore and spot facing-tools, Reamers, Screw threads.
- Tap and Dies, grinding wheel: Abrasive, grade structures, bond, specification, use, mounting and dressing.
- Lathe specifications, and constructional features, main parts. Lathe cutting tools.
- Chucks and chucking. Lapping, Honing: Applications, materials.
- Turning operations- Types, Uses, Methods.
- Maintenance - Total productive maintenance, -Autonomous maintenance, Routine maintenance, Maintenance schedules.
- Screws: material, designation, specifications, Power tools, Nuts, Keys.
- Heat treatment, various heat treatment methods. Various coatings used to protect metals.
- Gauges, Bearings, Bearing materials and Pipes and pipe fittings.
- Vee belts, commercial belts, Couplings, Pulleys. Power transmission.
- Industrial hydraulic system, Applications, Pascal's Law. Pneumatic valves, Hydraulic oil, filters, cylinders motors and valves.
- Lubrication and lubricants - Types, Purpose, Use.

POST: RFMDL12025

- Importance of safety and general precautions observed in the in the industry/shop floor - First aid, PPEs and Response to emergencies etc. Knowledge of fire and fire extinguishers.
- Hand & Power Tools: Marking scheme, marking material, Cleaning tools. Description, care and use of Surface plates, steel rule, measuring tape, try square. Callipers, Punches, Screw, driver, hammer, spanners, pliers.
- Systems of measurement: Description, Least Count calculation, care & use of – Micrometers, Vernier Callipers, and various gauges.

- Different types of metal joint (Permanent, Temporary), methods of Bolting, Riveting, Soldering, Brazing, Seaming etc. Fasteners, Cutting tools, Limits, Fits & Tolerances.
- Drilling machine, Description, different types, drill holding devices, Drill bits, Taps and Dies, Hand Reamers.
- Sheet metal: various common metal sheets used, Shearing, bending, Drawing, Squeezing Sheet metal joints, Hem & Seam Joints Fastening Methods.
- Ohm's law, Voltage, Current, Resistance, Power, Energy, Voltmeter, Ammeter, Ohmmeter, Fuses & circuit breakers.
- Description of Chemical effects, Batteries & Cells, Magnetic effects.
- Welding processes, Heat Treatment Process: Introduction, Definition.
- Non-destructive Testing: Various Methods, Definition and their importance.
- Internal & External combustion engines. Principle & working of 2 & 4 stroke diesel engine and S.I. Engine.
- Diesel Engine Components: Cylinder head, Combustion Chambers, Engine Valves, Camshafts & Drives.
- Description & functions of cylinder block, pistons, piston rings, crank shaft, camshaft, engine bearings.
- Description & functions of the fly wheel, vibration damper, clutch & coupling units attached to flywheel.
- Gas Turbine, Comparison of single and two stage turbine engines, Difference between Gas Turbine and Diesel Engine.
- Cooling systems: Types, Needs. Heat transfer method. Viscosity and its grade as per SAE, Lubrication system components.
- Description of Diesel Induction & Exhaust systems, components and air compressor.
- Fuel Feed System in IC Engine (Petrol & Diesel).
- Emission Control: Vehicle emissions, Standards - Euro and Bharat II, III, IV, V. Characteristics and Effect of Hydrocarbons, different types of smoke emission and their causes.
- Troubleshooting: Causes and remedy for Engine not starting Mechanical & Electrical causes, High fuel consumption, Engine overheating, Low Power Generation.
- Purpose of Oil filter, fuel filter, air filter and their periodicity of change.
- Function of Automatic Voltage Stabilizer.
- Maintenance of DG battery.

POST: RFAEL12025

- Hazard Identification, Response to emergencies- Power failure, system failure, fire etc. Types, Working of fire extinguisher. First Aid, PPEs, etc.
- Conductors and insulators, shouldering, underground cables. Ohm's Law, Kirchoff's Laws and applications. Laws of Resistance.
- Principles and laws of electro-magnetism. Capacitor - Inductive and Capacitive reactance, Comparison and Advantages of DC and AC systems.
- Chemical effect of electric current and Laws of electrolysis.
- CEA rules on electrical wiring. Types of domestic and industrial wirings.
- Importance of Earthing, various methods.

- Laws of Illuminations. Types of illumination system, Illumination factors, intensity of light, etc. Type of lamps, advantages/ disadvantages, etc.
- Measurement of various electrical parameters using different analog and digital instruments. Measurement of energy in three phase circuit. Errors and corrections in measurement.
- Working principles and circuits of common domestic equipment and appliances. Concept of Neutral and Earth.
- Working principle, construction, and classification of transformer. Types of Cooling, protective devices, bushings and termination, etc.
- DC generator- Principle, Use of Armature, Field Coil, Polarity etc. Load characteristics, Application, losses & efficiency, maintenance.
- DC motor - Principle, Type, Characteristics, Losses & Efficiency, Maintenance. Methods of speed control of DC motors.
- Working principle of three phase induction motor. Different types of starters for three phase induction motors. Various methods of speed control.
- Single phase AC motors - Principle, Type, Characteristics, Losses & Efficiency, Maintenance. Troubleshooting of single-phase AC induction motors and universal motor.
- Principle of alternator, e.m.f. equation, relation between poles, speed and frequency. Working principle of synchronous motor.
- Rotary Converter, MG Set Description and Maintenance. Resistors – colour code, types and characteristics. P-N junction, classification, specifications, biasing and characteristics of diodes.
- Basic concept of power electronics devices. Working principle and uses of oscilloscope. Study and understand layout drawing of control cabinet, power and control circuits.
- Wiring accessories. Working, parameters and applications of AC / DC drive. Basic concept, block diagram and working of voltage stabilizer, battery charger, emergency light, inverter and UPS.
- Conventional and non-conventional sources of energy and their comparison. Power generation by thermal, solar and wind energy.
- Transmission and distribution networks. Types of relays and its operation.

POST: RFSAA12025

- Accountancy: Conceptual framework, Income measurement, Final accounts, Depreciation Accounting, Concepts of Bills of Exchange, Letter of Credit / Bank Guarantee, Bank Reconciliation Statements & Cash Flow Statements.
- Business Organisation: Business objectives, Business environment, Business entrepreneurship (including location, choice of form of business and growth strategies), Business operations including finance, production, marketing and human resource development.
- Management: Concept of management, Planning, Organising, Leading and Controlling.
- Micro-economics: Price-mechanism, Theory of consumer behaviour, Elasticity of demand, Production function, Theory of costs, Market structures, Price-determination under perfect competition and monopoly.

- Business Statistics: Analysis of Univariate data involving measurement of Central tendency, index numbers, analysis of time-series and problem solving related to percentage, basic algebra, ratio, etc.
- Business Law: Indian Contract Act 1872, Sale of Goods Act 1930 and Negotiable Instruments Act 1881.
- Company Law: Kinds of companies, matters involving incorporation of company, shares and share capital and matters relating to issue and transfers of shares, members of a company and management of a company.
- Cost accounting: Procedures involved in cost accounting, marginal costing, cost-volume profit analysis, Budgetary control and Standard costing.
- Auditing: Meaning and objects of auditing, Types of audits and Audit process.
- Income Tax: Basic concepts, Residence and tax liability, heads of income and TDS - TCS.
- GST: - Provisions of SGST, CGST, IGST & UTGST laws. Emphasis on GST Returns and Payments of liability on GST Portal.

POST: RFSAH12025

- सामान्य हिन्दी: हिन्दी सामान्य परिचय एवं प्रमुख बोलियाँ, हिन्दी वर्णमाला एवं विराम चिह्न, शब्द रचना (उपसर्ग, प्रत्यय) संज्ञा (लिंग,वचन,कारक),सर्वनाम, विशेषण, क्रिया, काल,अव्यय, वाक्य रचना (वाक्य, उपवाक्य, पदबंध), संधि, संधि-विच्छेद, मुवाहरें एवं लोकोक्तियाँ,तत्सम, तद्भव, समानार्थी शब्द, पर्यायवाची शब्द, विलोम शब्द, सामान्य हिन्दी वाक्यांशों का अंग्रेजी में अनुवाद, हिन्दी साहित्य एवं पुरस्कार
- General English: Grammar, Comprehension, Sentence Completion and Structure, Sentence Rearrangement, Vocabulary, Articles, Tenses, Unseen Passages, Synonyms, Fill in the Blanks, Idioms & Phrases, Verb, Cloze Test, Error Correction, Antonyms, Suffix, Prefix, Pronouns, Prepositions, Conjunctions, Adjectives, Adverbs, Question tag, Active & Passive Voice, Translation into Hindi.
- Computer Aptitude: Computer Abbreviation, Computer Hardware, Computer Software, Operating System, Networking, Keyboard Shortcuts, Internet, Memory, MS Office – MS Excel, MS Word, MS Power Point. etc.

POST: RFCIV12025

- Importance of safety and precautions, housekeeping & good shop floor practices. PPEs, First Aid. Response to emergencies e.g. power failure, fire, and system failure. Occupational Safety & Health.
- Working Knowledge of Computer Applications: MS-Office Applications such as MS-Word, MS-Excel, MS-PowerPoint. etc.
- Building Materials and Construction: Stone & Bricks, Sand & Mortar, Timber & Miscellaneous materials, Painting & Varnishing, Foundation, Masonry, Doors & Windows, Damp proofing and floors, Plastering & Pointing.
- Water Resource Engineering: Introduction, Water requirements of crops, Definition of common terms, Hydrological cycles, Watershed management, Head works & Weir section, Gravity dam, Canals, Cross drainage works, Water logging.

- Civil Engineering Drawing: Doors and Windows, Roof Truss, Planning of Building, Stair-Case, Building Drawing, Perspective View drawing.
- Surveying: Introduction and overview, Measurement of distances, Chain survey, Compass survey, Levelling, Plane table survey.
- Structural Mechanics: Simple stresses and strains, Shear force, bending moments, Stresses in beams, Slopes and deflection of beams, Column, struts, Analysis of truss, Dams and retaining walls.
- Hydraulics: Measurement of Pressure, Flow of fluids, Flow through Open Channel, Pumps.
- Estimating-I: Types of estimates, Method of building estimate, Different items of work, Sanitary and plumbing, Estimate of RCC items of works.
- Computer Aided Drafting & Drawing: Working Knowledge of AutoCAD software, Basic command to get started, Setting up a drawing, Developing drawing strategies, Using layers, Using Blocks and W blocking, Generating elevation, Working with hatches and fills, Controlling drawing texts, Dimensioning, External references, Getting families with proper shape, Printing an AutoCAD drawing.
- Concrete Technology: Cement, Properties of concrete, Concrete mix design, Quality control of concrete, Extreme weather concreting & chemical Admixture in concrete, Properties of special concrete.
- Advanced Surveying: Contouring, Theodolite surveying, Curves, Tacheometry survey, Modern method of surveying.
- Transportation Engineering: Introduction, Investigation for road project, Geometric Design of Highway, Construction of Road Pavements and Materials, Traffic Engineering, Hill Roads, Drainage of roads, Maintenance and repair of roads, Introduction to Airport Engineering.
- Design of RCC Structures: Properties of Concrete and steel, Fundamentals of Limit State Method, General design considerations (IS:456-2000), Reinforced Concrete beams, Limit state of collapse –Shear and Bond, Reinforced Concrete Slabs (only simply supported), Reinforced Concrete Column (only short and axially loaded column), Design of footings, Basic concept of Pre-stressed concrete.
- Geo-Technical & Foundation Engineering: Properties, Permeability, Seepage analysis, Shear strength, Bearing Capacity, Compaction, Stabilization, Site investigation, Sub-Soil Exploration, Foundation Engineering.
- Advanced Building Construction & Earthquake resistant Technology: Excavation, Pile foundation, Building Planning & Orientation, Fire Protection & Building Acoustics, Earthquake, RCC building - Seismic Performance, Ductile detailing, Strengthening and retrofitting of existing structure.
- Estimating II: Earthwork, Roadwork, Rate analysis, Specification, Departmental works.
- Environmental Engineering & Pollution Control: Water Supply, Domestic Sewage, Industrial Waste, Environmental Pollution, Solid Wastes from Society, Environmental Sanitation.
- Design of Steel Structures: Introduction to steel structure, Design considerations (IS:800-2007), Riveted Connections, Bolted Connections, Simple beam connections, Welded connections, Design of - tension members, compression members, beams, column bases.

- Quality Control & Test: Relevant knowledge of field and laboratory tests (as per related IS Code) of building materials such as cement, aggregate, water, concrete, reinforcement, brick, etc; road works: soil, WMM, WBM, bituminous concrete, etc.

POST: RFELE12025

- Electrical safety and precautions, housekeeping & good shop floor practices. PPEs, First Aid. Response to emergencies e.g. power failure, fire, and system failure. Occupational Safety & Health, Oil Mines Regulation 2017 and CEA Regulations 2023.
- Elements of Mechanical Engineering: Properties and Laws of Gases, Properties of Steam, Generation of Steam, Steam Engine, Internal Combustion Engine, Steam Turbines, Gas Turbines, Transmission of Motion and Power.
- Principle of Electrical Engineering: Fundamental Concept, Magnetism and Electromagnetism, Electromagnetic Induction, Energy Conversion Principle, Electrostatic, AC Fundamentals, Phasor Algebra, AC Series Circuit.
- Elements of Electronic Devices: Semiconductor, Electronic devices: Transistor, Transistor amplifier, Feedback circuit and oscillator, Special semiconducting devices, Integrated circuits.
- Electric Circuit with Network: DC Network Theorem (With independent Source), DC Network Theorem (With dependent Source), AC Network Theorem, Single phase AC parallel circuit, Three phase circuit, Transients,
- Electrical measurement and Measuring Instruments-I: Unit, Dimensions and Standards, Measurement and instrumentation system, Electromechanical instruments, Measurement of resistance, Potentiometer, AC Bridge, Measurement of current and voltage.
- Electrical Machines-I: D.C. Generator, D.C. Motor, Single Phase Transformer, Three Phase Transformer, Special D.C. machine, Special Transformer,
- Electrical Engineering Materials: Conducting Materials, Semiconducting Materials, Insulating Materials, Dielectric Materials, Magnetic Materials, Electric Hardware, Constructional Materials.
- Electrical & Electronics Drawing and Design: Symbols and Notation, Winding, Electrical Wiring, Sub-Station.
- Electrical Measurement and Measuring Instruments-II: Measurement of power, Measurement of energy, Instruments for special purpose, Electronics Instrument, Primary sensing element and transducer, Data transmission and telemetry Microprocessor based Instrumentation system.
- Electrical Machines II: Poly phase induction motor, Single phase of induction motor, Alternators, Synchronous motor, Commutator motor, Special A.C. machine.
- Electrical Power: Generation of Electrical Power, Transmission/Distribution of Electrical Power, Mechanical Design of Transmission/Distribution Line, Substation, Power System Stability.
- Non-Conventional Energy: Sources, consumption, Solar Energy Engineering, Wind Energy Engineering, Ocean Energy Engineering, Geothermal Energy Engineering, Bio Energy Engineering, Direct Energy Conversion Systems, Chemical Energy Sources.
- Electrical Estimating, Costing and Contracting: Elements of estimating, Basis of Estimates, Principles of Contracting, Estimating and Costing of domestic and industrial Wiring, Estimating and costing of service connection, Estimation of overhead and underground Distribution System, Estimation of Small Substations, Estimating and Costing of repair and maintenance and electrical devices and equipment.

- AC Distribution and Utilization: AC Distribution, SCADA System for Electrical Distribution, Power Factor Improvement, Electrical Tariff, Cables, Electric Heating and Welding, Electric Drives, Illumination, Electro Chemical Power.
- Switchgear and Protection: Elements of Protection, Relays, Earthing, Circuit Interrupting Devices, Arc Formation Process, Circuit Breaker, Protection Scheme, Over Voltage Protection, Lightning protection.
- Installation and maintenance of electrical equipment: Tools and Accessories, Installation, Commissioning practices, Earthing, Testing, Maintenance, Trouble shooting.