PPSC JE Syllabus 2021

In PPSC JE Exam questions are asked from Civil Engineering, Mechanical Engineering, Logical Reasoning, Mental Ability and General Knowledge. Each of these subjects has a defined list of topics which must be covered by the candidates. The subject-wise details of PPSC JE Syllabus are given below:

PPSC JE Syllabus: Civil Engineering

Candidates who apply for Civil Engineer posts have to attempt questions from Civil Engineering section. The topics from which questions are asked in this section are as follows:

- FLUID MECHANICS: Introduction, Properties of Fluids, Hydrostatic Pressure, Measurement of Pressure, Fundamentals of Fluid Flow, Flow Measurements, Flow-through Pipes,discharge through channels using Chezy's formula and Manning's formula, most economical sections, rectangular, trapezoidal and circular etc., Hydraulic Pumps and motors.
- CONSTRUCTION MATERIALS & BUILDING CONSTRUCTION: General characteristics of stones, Requirements of good building stones, Identification of common building stones, Bricks and Tiles, Cement, Lime, Timber and Wood-Based Products, Paints and Varnishes, Miscellaneous Materials etc., Introduction to Building Construction, Foundation, Walls, Masonry, Arches and Lintels, Doors, Windows and Ventilators, Damp Proofing and WaterProofing, Floors, Roofs, Stairs,
- ENGINEERING DRAWING: Lettering Technique and Practice, Dimensioning Techniques (Necessity of dimensioning, method and principles of dimensioning etc.), Scales (need and importance of scales, Drawing of plain and diagonal scales etc.), Projections, Sections, Symbols and Conventions
- APPLIED MECHANICS: Introduction, Laws of forces, Moment, Friction, Centre of Gravity etc
- EARTHQUAKE RESISTANT BUILDING CONSTRUCTION: Elements of Engineering Seismology, Performance of building during earthquakes and Mode of failure, Special construction method, tips and precautions to be observed while planning, designing and construction of earthquake resistant building, Seismic Provision of Strengthening and Retrofitting Measures for Traditionally- Built Constructions, Brick and RCC Structures, Provision of reinforcement detailing in masonry and RC constructions.
- STRUCTURAL ENGINEERING: Simple stresses and strains, Elasticity, Hooke's Law, Moduli of Elasticity and Rigidity. Stresses and strains of homogeneous materials and composite sections. Types of beams and supports and loads, Concept of bending moment and shear force. Bending moment and shear force diagrams for simple cases. Deflection in beams
- SOIL AND FOUNDATION ENGINEERING: Physical Properties of Soils, Classification and Identification of Soils, Permeability and its importance, Effective Stress, Strength Characteristics of Soils, Compaction, Bearing Capacity of soil, Concept of shallow and deep foundation; types of shallow foundations and their suitability. Factors affecting the

depth of shallow foundations, deep foundations, type of piles and their suitability; pile classification on the basis of material, pile group and pile cap etc.

- WATER SUPPLY AND WASTE WATER ENGINEERING: Water Supply- Water requirement, Rate of demand and supply, Per capita consumption, Water Treatment including Sedimentation, Laying out Pipes Waste Water Engineering-Definition of terms in sanitary engineering, Surface drains, Types of sewage, Sewerage, Laying and Construction of Sewers, Sewage characteristics, Natural Methods of Sewage Disposal, Sewage Treatment, BOD, COD, Building Drainage, Drains and Sewers, Traps, inspection chamber, Septic Tank and Soak Pit, Bathroom and W.C connections etc.
- TRANSPORTATION ENGINEERING: Introduction of Transportation Engineering, Traffic Engineering, Road materials, Geometric design, Design of flexible and rigid pavements, Road maintenance, Railway Engineering Rails, Sleepers, ballast, points and crossing, Track laying and track maintenance.
- ENVIRONMENTAL ENGINEERING: Importance of Environmental Engineering, Water Pollution Pollution, Noise Pollution, Effects of mining, blasting and deforestation, Land Use soil degradation problems - erosion, water logging, soil pollution etc.), Environmental Impact Assessment, Legislation to Control Environmental Pollution, Renewable Source of Energy etc.
- IRRIGATION ENGINEERING: Introduction to irrigation, methods of irrigation, tube well irrigation, tank irrigation, sprinkler irrigation, drip irrigation, water logging, design of irrigation canals and irrigation outlets.
- QUANTITY SURVEYING AND VALUATION: Introduction to quantity surveying and its importance, duties of quantity surveyor, types of estimates, measurement, preparation of detailed and abstract, estimates from drawings, calculation of quantities of materials, analysis of rates, contractorship, preparation of tender document based on Common Schedule of Rates (CSR).
- REPAIR AND MAINTENANCE OF BUILDINGS: Need for maintenance, agencies causing deterioration (sources, causes, effects), investigation and diagnosis of defects, defects and their root causes, materials for repair, maintenance and protection, remedial measures for building defects, surface preparation techniques for repair, crack repair methods, repair of surface defects of concrete, repair of corrosion in RCC elements.
- BASICS OF MANAGEMENT: Introduction, Leadership, Motivation, Ethics and Values, Team related skills- sympathy, empathy, co-operation, concern, lead and negotiate, work well with people from culturally diverse background, Communication in group - conversation and listening skills, Task Initiation, Task Planning, Task execution.
- CONSTRUCTION MANAGEMENT AND ACCOUNTS: Construction Planning, CPM, PERT, site organization, Construction Labour, Payment of Wages Act 1936 , Minimum Wages Act 1948 (as amended), control of progress, inspection and quality control, accidents and safety in construction, accounts, public work accounts, request for quotation, bill of quantities, measurement book, indent book, material at site register.

PPSC JE Syllabus: Mechanical Engineering

- ELECTRICAL CIRCUITS AND MACHINES: Concept of alternating current and voltage, average value, r.m.s value, form factor, power factor etc., Phasor algebra, AC Circuits, susceptance, conductance and admittance, Active and reactive components of current and their significance, Power, Power factor and its significance, Resonance in series and parallel circuits. Faraday's laws, magnetization curve, constructional features of generators and motors, D.C. Machine: basic principles, emf equation, description of different parts and working, different types, characteristics and applications of D.C. machines. S.C. and O.C. Distribution and power transformers, 1-phase Autotransformer, Three Phase transformer: Single unit or 3 single-phase units connections, Vector grouping, Scott-connected transformer, 3-phase transformers in parallel.
- ELEMENTS OF MECHANICAL ENGINEERING: Thermodynamics: Energy, laws of Thermodynamics, Heat and work, Enthalpy. Reversible and irreversible processes, Entropy, Description of various Types of Boilers. Basic concepts of Thermal conduction, convection and radiation. Concept of black opaque and white bodies, Stefan Boltzman's laws. Strength of Materials: Concept of Bending Moment and Shear Force, Bending Moment and Shear Force diagrams for cantilevers, simply supported beams to concentrated loads, Concept of Torsion and equation of torsion for circular shaft, Close coiled spring for axial load, Stiffness of spring, angle of twist and proof resilience.
- ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING: Basic electrical quantities, DC Circuits, Ohm's law, resistances in series and parallel, Kirchhoff's laws and their applications in solving electrical network problems, Network theorems such as Thevenin's theorem, superposition theorem, Maximum power transfer theorem and Norton's theorem, Star-delta transformation. Current and voltage sources and their conversion. Semiconductor Theory - Atomic structure and Energy band theory, intrinsic and extrinsic semiconductors and effect of temperature on them; Semiconductor Diodes, operating point and effect of temperature, Single-Stage Transistor Amplifiers - Concept of DC and AC load line, Voltage gain, Concept of input and output impedance, AC equivalent circuit, voltage gain, Frequency RC coupled two-stage and direct coupled amplifier, Construction, operation, characteristics and applications of JFET and MOSFET
- MANUFACTURING PROCESSES: Dry sand and green sand casting: casting defects: Die casting, continues casting and Centrifugal casting, Welding Process: Gas welding, Arc welding, Resistance welding; Thermit Welding: Soldering, grinding wheel: gear generation processes; Electric discharge machinery, ultrasonic machining, electrochemical grinding, Forming processes: Hot and Cold working: Rolling: Punching blanking, shearing.
- MEASUREMENT AND MEASURING INSTRUMENTS: Static and dynamic characteristics, Classification of electrical measuring instruments, Deflection torque and methods of production, controlling torque and controlling system, Damping torque & methods of damping, Different types of instruments: Construction & operating principle, Merits and demerits, Errors and remedies, Thermocouple instruments. Digital instruments: Voltmeter, ammeter, multimeter, energy-meter; Measurement of Displacement and Strain: Wire wound potentiometer, LVDT, strain gauges and their different types such as inductance type, resistive type, wire and foil type etc. Gauge factor, gauge materials, and their selections.

- ENGINEERING MATERIALS: Introduction of Engineering materials, Ferrous materials, alloying materials, Non-Ferrous metals, aluminum and its alloys, High speed steel, Plastic materials, hardening and hardening processes, Time temperature transformation curve.
- BASICS OF MANAGEMENT: Introduction, Leadership, Motivation, Ethics and Values, Team related skills- sympathy, empathy, co-operation, concern, lead and negotiate, work well with people from culturally diverse background, Communication in group - conversation and listening skills, Task Initiation, Task Planning, Task execution, Task close out, Customer Relationship Management (CRM), Need, various types of customers, customer satisfaction, life- long customer, Customer Satisfaction Index (CSI) and its significance, Elementary knowledge of Income Tax, Sales Tax, Excise Duty, Provident Fund, Employees State Insurance Act, Labour welfare schemes, Labour laws, worker and public safety techniques, systems of wage payment, incentives

PPSC JE Syllabus:Mental Ability

- Simplification
- Ratio and Proportion
- Averages
- L.C.M. and H.C.F.
- Time and Work
- Time and Distance
- Partnership
- Height and Distance
- Simple and Compund Interest
- Mensuration
- Number System
- Mixture and Allegation
- Boats and Stream
- Probability
- Permutation and Combination

PPSC JE Syllabus: Logical Reasoning

- Coding-Decoding
- Analogies
- Statement and Arguments
- Statement and Conclusion
- Statement and Assumption
- Data Interpretation
- Non-Verbal Reasoning
- Clocks and Calendars
- Blood Relations

- Syllogism
- Mirror Images
- Number Series

PPSC JE Syllabus: General Awareness

- Current Affairs
- Indian Culture
- Indian Polity
- Indian Economy
- Important dates and days
- Countries and Capitals and Currencies
- Geography
- Books and Authors
- Inventions and Discovries
- Sports
- Science and Technology
- General Science