

SYLLABUS FOR ENTRANCE EXAMINATION FOR THE POST OF
JUNIOR ENGINEER (CIVIL)
IN
PEPSU ROAD TRANSPORT CORPORATION

TOTAL QUESTIONS: 100
HOURS

TIME ALLOWED: 2.00

SECTION A: GENERAL (50 QUESTIONS)

General Awareness and General Knowledge: General information about the state of Punjab, Economy, Science and Technology, Current Events, History, Geography, Political Awareness/Polity, Persons in News, Places in News, Important Awards & Honours, Sports

(10)

Quantitative Aptitude: Numbers, Simplification, HCF & LCM, Percentage, Average, Ratio & Proportion, Profit & Loss, Partnership, Time and Work, Time and Distance, Area and Volumes, Trigonometry, Probability, Permutations & Combinations.

(10)

Reasoning Ability: Analogy / Analogous Problems, Classification, Word formation, Series, Ranking / Arrangement, Coding & Decoding, Distance and Direction, Symbol & Notation, Scheduled Day or Date, Mathematical problems, Problem Solving: Data Analysis.

(10)

Computer Awareness: Introduction of Computer and History, Operating Systems, PC and System Software, Computer Network, Computer Devices, Windows, Microsoft Office, MS Word, MS Excel, MS PowerPoint, Internet Programming Language (HTML/DHTML), Security Aspects for PC, e world, Advanced Technology Regarding Computer, Various uses of Computers.

(05)

General Punjabi up to Matric standard

(07)

General English: Comprehension, Common Errors, Sentence Improvement, Fill in the blanks, Antonyms and Synonyms, Use of Propositions, Nouns, Adverbs and Adjectives, Change of voice, Direct & Indirect speech.

(08)

SECTION B: PROFESSIONAL (TOTAL: 50 QUESTIONS)

Irrigation Engineering: Introduction to irrigation, Soils and Crops, Water requirement of Crops, Method of Irrigation, Tubewell Irrigation, Tank Irrigation, Sprinkler Irrigation, Drip Irrigation, Water logging, Investigation and preparation of Irrigation Projects, Design of Irrigation Canals and Irrigation Outlets.

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. Moment area theorem, Bending and shear stresses in circular, rectangular, T and L sections, Comparison of strength of the above sections, Design of singly and doubly Reinforced beams, Design of Columns-Types of Columns. Short and long column, load carrying capacity, effective length of column, lateral and helical ties.

I.S. Specifications for reinforcement detailing. Design of slabs types of slabs, one-way slab, two-way slab, I.S. specifications for Reinforcement detailing method of design as per I.S. code. Design of foundations-isolated footing rectangular footing, square footings, circular footings. Design of tension members in structural steel, gross area, net area, tension splice, design of tension member. Design of compression members, column splice, load carrying capacities. Design of beams in structural steel.

Surveying: Linear measurements with tape, corrections, chain surveying, offsets, perpendicular offset, oblique offset, measurement of offsets, limiting length of offset, Field book, Instructions for booking field notes, Instruments for setting out right angles, Compass surveying, Prismatic compass. Surveyor's compass, comparison between prismatic and surveyor's compass, meridians & bearings, calculation of included angles from bearings, calculation of bearing from including angles, local attraction, magnetic declination levelling, types of levels. Principles of levelling, Classification of levelling. Rise & Fall method, Height of Instrument method, various corrections in levelling. **Transportation Engineering:** Introduction of Transportation Engineering, Traffic Engineering, Road materials, Geometric design, Design of flexible and rigid pavements, Road maintenance, Railway Engg. Rails, Sleepers, ballast, points and crossing, Track laying and track maintenance.

Soil and Construction Engineering: Foundations-types, construction details, walls, load bearing and non-load bearing walls, brick masonry, bonds in masonry, stone masonry, type of a stone masonry, partition walls, doors. Floors-types of floors, construction procedure, maintenance of buildings, properties of bricks and stones, cement, aggregates, workability of concrete, Batching, mixing, compaction, placing, curing of concrete. Properties of hardened concrete. Introduction to soil mechanics, Soil classification. Index properties of soil, Shear strength concept.

Fluid Mechanics, and Water Supply Engineering: Specific weight, density, specific gravity, viscosity, vapour pressure, cohesion, adhesion, surface tension, capillarity and compressibility. Pressure, intensity of pressure, pressure head, and pascal's Law and its applications. Total pressure, resultant pressure and centre of pressure on rectangular, triangular, trapezoidal, circular and curved surfaces. Atmospheric, gauge and absolute pressure, simple differential manometers. Steady and unsteady flow, laminar and turbulent flow, uniform and non-uniform flow. Discharge and continuity equation, Bernoulli's theorem, statement and description, venturimeter, orifices, time of emptying tanks of uniform cross section by a single orifice. Laminar and turbulent flow explained through. Reynolds experiments. Reynolds number and critical velocity and velocity distribution, losses in pipes, hydraulic gradient line, and total energy line flow from one reservoir to another through a long pipe of uniform and composite section. Water hammer, uniform and non-uniform flow, discharge through channels using chezy's formula and Manning's formula. Most economical sections, rectangular, trapezoidal and circular. Measurement of discharge by notches and weirs, measurement of velocity by Pitot tube and current meter, water supply, sources of water. Types of pipes, lying of pipes, Quality of sewage, lying of sewers, Building drainage and rural sanit.