

## OVERSEER EXAM SYLLABUS

### Surveying

**Chain Surveying**-terms- Instruments (including Instruments to set out right angles), Types of ranging, Direct ranging and indirect ranging - Chaining along sloping ground, Sources of Errors in survey(Mistakes, Systematic errors, Accidental Error), Most Probable Value, Errors in Chaining, Tape Corrections, Degree of accuracy in chaining, Chain Triangulation, Field book, Problems in Chaining

**Plane table survey** - Instruments, Working operation, Systems of plane tabling

**Compass survey**-Units of angle measurement, Instruments, WCB & RB, Forward Bearing and Backward Bearing(Problem), Features of Magnetic Compass(Surveyor, Prismatic and Transit) - Temporary and Permanent adjustment, Magnetic Declination(Definitions), Local attraction, Dip, Errors in Compass Survey

**Theodolite** - General, Definitions (based on of instrument and working operations), Temporary adjustment, Measurement of horizontal angle and vertical angle, Sources of errors in theodolite

**Traversing** - Methods of Traversing, Checks in traverse, Principle methods of plotting, Latitude and Departure, Closing error, Balancing the traverse, Degree of accuracy

**Tachometric Surveying** -Instruments, systems of tacheometric measurements, substense bar, reduction of stadia notes and EDM

**Levelling** -Definitions, Methods of Levelling (Direct, Indirect, Trigonometric, Hypsometry), Levelling Instruments - HI method and Rise and fall method, Defects in lens and characteristics, Degree of Precision

**Contouring** - Terms and definitions, contour interval, characteristics of contour, methods of locating contour, interpolation, Calculation of Area and Volume-Mass haul diagram

**Curves** - Types, Definitions and Notations, Designation, Elements of Simple Curve,

Methods of Setting out

**Advanced Survey** - Total station- Hydrographic Survey - Astronomical Survey - Photogrammetry

## **Mechanics**

Simple mechanics- load and effort, Mechanical advantage, velocity ratio, efficiency, work, power and energy, simple stress and strain, friction, shear force and bending moment, speed and velocity

## **RCC**

**Cement-** Definition, IS codes for types of cement, Grades of cement, Classification

**Fine aggregate-** Definition, Function, Sources, Types, Bulking of sand, Fineness modulus, Coarse aggregate – Definition, function, sizes

**Water** – Definition, Mixing, Curing, pH value, permissible limits of solids

**Admixtures** – Definition, Types, examples

**Reinforcement** – Characteristics needed, types-IS code, Characteristic strength ( $f_y$ ), Yield Stress, Permissible stress table, Weight of bars, Bending of bars, Cranking of bars, Overlapping of bars, Anchorage value.

**Concrete-** Grades of concrete, Types of mix, Proportions in concrete, Minimum grade of concrete, Workability – Factors affecting, Test for workability – Slump, Compaction factor, Vee bee Consistometer

## **Estimation**

Purpose of estimate - Sanctions required-Administrative sanction - Technical Sanction - Financial sanction - Different types of estimates - Preliminary Estimate - Per unit basis estimate – Plintharea estimate - Cube rate or Cubical content estimate - Approximate quantity method - Detailed Estimate - Abstract estimate - Revised estimate - Supplementary estimate - Supplementary and revised estimate - Annual repair or maintains estimate-Technical terms: Contingency -

Work charged establishment staff or security - Tools and plants- Centage charge or departmental charge - Electrification - Plumbing and - Fittings - Sub head item of works - Sub work - Schedule of rates - Data book - Cost index - Price - Bill of quantity - Day work - Plinth area - Floor area - Circulation areas- Carpet area - Capital cost- Initial lead - Initial lift- Method of estimates- Longwall short wall methods- Total Centre to centre line method- Standard units - Deduction - Cement concrete -Brick works- Plastering - Quantity calculation - Cement concrete using 40mm broken stone- Cement concrete using 20 mm broken stone - Plastering - Rubble masonry - Brick masonry - Roof covering materials

Valuation - Introduction - What is Valuation - Purpose of Valuation - Valuer - Value - Cost - Price Technical terms: Gross income - Sinking fund - Outgoing - Net income - Deferred income - Salvage value - Scrap value - Market value - Factors affecting market value - Book value - Assessed value - Distress value of forced sale value - Following - Potential value - Sentimental value - Accommodation value - Reversionary value - Capitalized value - Years purchase - Depreciation - Obsolescence - Annuity - Annuity certain - Annuity due -Perpetual annuity - Deferred annuity - Rent - Free hold property - Free holder - Lease hold property - Mortgage - Mortgagee - Mortgagor - Mortgage deed - Equity redemption- Easement - Dominant owner: - Servient owner

### **Building materials and construction**

**Bricks**-Composition, Harmful ingredients, Manufacture of brick, Qualities of brick, Test on bricks, Size and weight of brick, classification, classification based on shape of bricks-Fire bricks and its classifications

**Stones**- Introduction , Classification of rocks- geological, chemical and physical, Rock forming minerals- and sedimentary rocks, Texture of a rock, Fracture of a rock, Test for stones, Qualities of good building stones, Quarrying, Methods of quarrying,Materials for Blasting- Cement-Introduction, History, composition of

ordinary cement, Setting action of cement, Manufacturing process, Field tests, laboratory tests, Storage of cement, Types of cement

**Ceramic materials-** Ceramics, clay products, tiles- common tiles and encaustic tiles, Teracotta, Earthenware, Stoneware, Porcelain, Refractories, glazing

**Lime-** Introduction, definitions, Classification of binding materials, sources of lime, Classification of lime, IS classifications, Manufacturing process

**Glass-** Properties of glass, Types of glass, Manufacturing process, Treatment of glass, Special varieties of glass

**Paints-** characteristics, PVCN, Ingredients in a paint, Types of paint, Defects in painting, Varnishes- characteristics, ingredients, types of varnishes, Distempers

**Timber-** Introduction, classification of trees, Structure of a tree, Macrostructure, microstructure, seasoning of timber, Preservation of timber, Defects in timber, qualities, Storage of timber, market forms of timber, industrial timber

**Ferrous metals-** introduction, Iron ores- Pig iron-manufacturing process, essential parts of blast furnace, properties, uses, types of castings, defects, characteristics,

**Wrought iron-** properties, manufacturing process, defects and uses

**Steel-** Introduction, Manufacturing process, uses, Factors affecting physical properties, Magnetic properties, Defects in steel, Properties of mild steel and hard steel, Mechanical treatment of steel, Heat treatment process, Market forms of steel, Non ferrous metals- Aluminium, Cobalt, copper, Lead, Magnesium, Nickel, Tin, Zinc, Alloys of Aluminium, Magnesium, Nickel

**Mortar-** General, Sand, Natural sources of sand, Classification of sand, Properties of good sand, classification of mortars

**Stairs-** Definitions, Technical terms, Types of stairs, Ramps, Moving stairs, Requirements

Doors and Windows- Definitions, Types of doors, Types of windows, standard data's, Hinges

**Roofs-** Definitions, Types of roofs

**Floors and floorings-** Definitions, Types of floorings, Factors affecting the choice of

flooring material, Materials used for flooring

**Plastering**, Types of pointing, Types of plastering, Damp proof course- Introduction, Causes, Effects, Material used for damp proofing, Termite proofing

**Carpentry and joinery**-Definitions, Classification of joints- Lengthening joints, widening joints, Angle joints, Oblique shouldered joints

**Scaffolding**- Definitions, Types, Shoring- Definitions, types

**Foundation**- Basics- classification- shallow foundation- Deep foundation- Cofferdams- Definitions, Types, Caissons- uses and types

**Plastics**- Types, properties

**Arches**- technical terms, classification- shape, no of centre, workmanship material lintels- Types

**Brick masonry**- Technical terms- Bond- 10 types- connections

**Stone masonry**- Technical terms- joints- masonry- rubble, ashlar- reinforced brick work- cavity walls- composite masonry

## **Graphics**

Definition - Drawings prepared by engineers are of engineering objects - Graphical representation of physical objects - IS codes - Drawing instruments- Drawing sheets - Drawing board - T-square - Set square - Protractor -Engineering scale set - Instrument box - Compass - Large bow compass - Spring bow compass - Drop spring bow compass - Divider - Large bow divider - Small bow divider - Drawing pencils - Erasing shield - Template - Stencil - French curves - Flexible curve - Lines - Type of lines

Lettering - Types of lettering - Size of lettering - Dimensioning - Types of dimensioning - Elements of dimensioning - Arrangements of dimensioning - Methods of indicating dimensional values - Shape indications Conic sections - Types of conic sections - Miscellaneous curves - Plane curves - Types

Space curves - Types- Systems of projections - Planes of projections- First angle projection - Third angle projection - Symbols of projections - Projection of points - Projection of lines - Miscellaneous curve - Projections

## **Railway**

Introduction, History, Railway zones, Permanent way– requirements of an ideal permanent railway, capacity of a railway track, gauges, Rails – Functions, Requirements of rails, Types of rail sections, length of rails, corrugated rails, hogged rails, kinks in rails, buckling of rails, rail failures, wear on rails, rail joints and its types, creep of rails, welding of rails – methods of welding of rails, length of welded rails

Coning of wheel, Tilting of rail, Adzing of sleepers, Sleepers – Functions of sleepers, Classification of sleepers and its advantages and disadvantages, size of sleepers. Sleeper density, Spacing of sleepers

Ballast – Functions of ballast, Types of ballast, size and section of ballast Track fittings and fastenings – Fishplates, Spikes, Bolts, Chairs, Keys, Bearing plates Plate laying – Definition and its methods, Problem, Technical terms – Weighing bridges, Loading gauges, End loading ramps, Engine sheds or loco sheds, Ash pits - Station – Types of stations, Yards – Types of yards, Track maintenance, Track junctions

Geometric design of the track – Gradient, Types of gradient, Grade compensation, Problems, Super elevation or Cant, Equilibrium speed, Cant deficiency, Cant excess, Negative super elevation, Types of curves, Types of transition curves, Length of transition curves--- Examination pits, Drop pits, Triangle, Turn table, Traverser, Scotch block, Fouling marks, Buffer stops, Sand hump, Sidings, Loop --Points and crossings – Definition, Necessity of points and crossings, Technical terms and its arrangements Signals – Classification of signals, Interlocking, Track circuiting

## **Water Resources engineering**

Water requirement of crops - Crop season - Classification of crops - Consumptive use - Efficiencies

Duty - Delta - Layout of Distribution system - Design of canals - Non-alluvial canals

Cross Drainage work - Canal over Drain - Drain over Canal - Canal & Drain in same level

Methods of Irrigation - Surface - Sub-surface & Sprinkler irrigation

Diversion Head works - Weirs – Components

Spillways – Types

### **Hydraulics**

Properties of fluid Mass density, Specific gravity, Specific volume, Specific gravity, Viscosity, Compressibility, Surface tension & capillarity

Measurement of pressure- Fluid pressure at a point, Variation of pressure in a fluid, Pascal's Law, Atmospheric, Absolute, Gauge and Vacuum pressure, Measurement of pressure

Type of Hydraulic energy

### **Workshop calculations**

Units – British, MKS, SI Units – and their conversions – Length, area, Volume, Mass and Time – Definition of Mass, Weight, Density, Specific Gravity – Determination of Sides and area of triangles, polygons, Circles, segment and sections – surface area and volume of cubes, cylinder, prism, pyramid, cone, sphere – Simpson's Rule – Application – Area of ellipse – Simple Problems.

### **Building by-laws**

function of local authority-study of KBR, compare bye – laws published in National building Code Applying building bye-laws in the design and layout of buildings referring KBR and NBC and local bodies- Master plan -objects – necessity-features-drawings to be prepared principles and techniques of planning roads, streets and other service lane- Chandigarh and Gandhinagar city.

### **Public health and sanitation**

Public health and sanitation, house drainage and system of plumbing, Sanitary fittings, Treatment of sewage from residential building, drainage plan of a

building, water supply engineering, sewer appurtenances

### **Transportation Engineering**

Objects-Planning principles-classification of urban roads-through and bye-pass roads-outer and inner roads-expressways-freeways-types of street systems-precinct-traffic management- objects-traffic congestion- traffic control- road junctions, planning principles- classification of junctions –parking- traffic capacity of roads - problems-causes of accidents traffic signals-signs-markings-lighting.

### **Principles, necessity and objectives of Town planning**

its Representation, origin and growth of town-natural and planned-horizontal and vertical-stages in town development – define city, district unit, Municipality, neighborhood unit – distribution of land uses-zoning – objects and Principles-advantage- classification – use zones, height zones and density zones – density – net and gross – local density –calculation.

**Disclaimer : This is a tentative syllabus for Overseer level examinations. Exact syllabus will be published by KPSC in their website. Apart from this syllabus, questions can be expected from other topics which is not mentioned here.**

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