

SYLLABUS FOR SECTIONAL OVERSEER GR II (CIVIL)**BUILDING MATERIALS:**

- Brick: Composition, Classification, manufacturing process and uses.
- Concrete: Composition & promotion of ingredients, mixing and placing, water cement ration.
- Timber: Classification & structure, defects, disease & decay, seasoning & use.
- Paint, Varnished & Distemper: Purpose of painting, ingredients of paint & varnished, purpose of applying distemper & process of distempering.

BUILDING CONSTRUCTION:

- Bearing Capacity of Soil: Determination of bearing capacity of soil, method improving bearing capacity of soil.
- Foundation: Definition, load on building, types of building foundation.
- Stair Case: Location, types of stair case & importance of stair case with reference to building construction.
- Roof.
- Details of Doors & Windows.

SURVEYING:

- Chain Survey: Definition, principles of chain survey, error due to incorrect ranging, error in length. Numerical problems.
- Compass Survey: Definition, basis difference between chain & compass survey, bearing of lines, types of meridians, whole circles & quadrantal bearing. Numerical problems.
- Levelling: Definition of different terms in levelling methods of finding out reduced level, fields book recording, effects of curvetion & refraction. Numerical problems.
- Contouring: Definition, uses and characteristics of contour, methods of contouring.
- Plane Table Surveying: General description, accessories of place table, setting up of place table, orientation, two point & three point problem.

P.W.D ACCOUNTS

- Organisation of Engineering Department: Regular and work-charge establishment, duties and responsibilities of Sectional Overseer.
- ii. Work: Classification of work, original, major, minor, repair work, annual repair, special repair. Method of execution of work: through contract or departmentally, contract agreement, work order, item rate contract, lump sum contract, schedule rate contract & cost plus percentage contract. Measurement Book, muster roll, quittance roll, method of labour payment and use of forms and necessity of submission.

ROAD ENIGEEERING:

- Road Project: road survey, preparation of map, land acquisition, road alignment, longitudinal section, cross section & formation.
- Classification of Road: Classification of roads as per I.R.C & cross section of different classes of roads.

- Design, construction & maintenance of roads: Earth & gravel roads, W.B.M. roads, bituminous roads, difference between flexible and rigid pavement.
- Road Drainage: Drainage of urban road and hill roads.
- Traffic Engineering & Traffic Control: road junction, grade separation, traffic island, pedestrian crossing, road signs.

DESIGNING, DRAWING AND DETAILING

- Introduction: Details of R.C.C. beam, slab, column, lintel, footing and stair case.
- Design of R.C.C. beam, slab, column, column footing, numerical problems.
- Design of simple Steel Structure: types of joints, permissible stresses in rivets, design of joints, framed connection & seat connection. Numerical problems.

ESTIMATING

- Introduction: General idea of estimating, use of standard estimating forms, use of schedule of rates.
- Earthwork: Unit of measurements, different methods of calculating quantity of earth. Numerical problems.
- Road work: Unit of measurement, method of estimating various items of work.
- Concrete work: Unit of measurement, method of estimating mass-concrete and reinforced concrete work and shuttering.
- Masonry work: Units of measurement, method of estimating brick masonry & reinforced brick masonry.
- Rate Analysis

SOIL MECHANICS

- Introduction: Definition, particle size, classification, particle arrangement in coarse-grained, clays and composite soil.
- Soil Engineering Tests: Water cement ratio, specific gravity, particle size distribution, liquid limit determination and plastic limit determination, application of consistency limit. Numerical problems.
- Permeability: Head, gradient, Dory's law, laboratory determination and field determination of permeability, concept of seepage, discharge through flow nets, flow net sketches.

SANITATION

- Introduction: purpose & principles of sanitation, requirement of rural and urban sanitation.
- Underground Drainage & Sewerage: Quantity of sewerage, types of sewer, construction, laying and jointing Manhole.
- Disposal of Night Soil: Septic tank and soak pit function and design.
- Sewage Disposal: Primary treatment, grit chamber, clarifier, flow diagram of treatment plant, trickling filter, activated sludge process design.

HYDRAULICS:

- Hydrostatics: Density, specific gravity, surface tension viscosity & their units, definition of pressure, intensity of pressure, atmospheric pressure, gauge pressure, total pressure, centre of pressure, buoyancy, centre of buoyancy, metacentre & metacentric height. Numerical problems.
- Hydrodynamics: Basic equation of fluid flow & application, equation of continuity of liquid flow, Bernoulli's theorem & its application, venturimeter, orifice meter, pitot tube. Numerical problems.
 - Definition of various hydraulic co-efficients and their relationship. Numerical problems.
 - Difference between notches and weirs deduction of discharge formula for different types of notches. Numerical problems.
 - Flow of water through pipes, various losses in flow through pipes, derivation of formula. Numerical problems.
- Hydraulics Machines: turbine-general classification & principles. Types of pump-centrifugal pump & reciprocating pump.

IRRIGATION AND HYDRAULIC STRUCTURES:

- Introduction: Definition necessity for irrigation, types of irrigation in India.
- Rainfall and Run off: Measurement of rain, rain gauge, run off, factors effecting run off, characteristics of catchment area, factors effecting run off.
- Water Requirement of Crops: River, lake, well, tube well, yield from these sources, river head work.
- Storage Dam: concrete dam and earth dam, materials used for construction, advantages and disadvantages, construction of dams.
- Lift Irrigation: Wells, dupe wells and tube wells.

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- Rate Analysis: analysis of rates of brick, plain cement concrete work, R.C.C. work, door, window, plastering, R.C.C. floor, white washing, shuttering, D.P.C. & carriage of materials.
- Types of Estimate: Plinth area estimate, cubic rate estimate, detailed estimate, revised estimate, supplementary estimate, annual repair estimate, contingency and work charged establishment, departmental charge, bill of quantities & costing. Numerical problems.