WORK ASSISTANT (CIVIL)

PAPER – II
MARKS – 100

Unit I : Building materials **(20 marks)**

Rocks– classification, types and uses
Stones – classification, types and uses
Bricks - Manufacturing, classification, types and uses
Lime– classification, types and uses
Pozzolanic - classification, types and uses
Cement – Manufacturing, classification, types and uses
Clay Products – earthenware, stoneware, porcelain, terracotta, glazing and types.
Mortar– Preparation, classification, types and uses
Concrete – Preparation classification, types and uses
Timber - Structure, defect classification, seasoning and uses
Admixtures - for cement mortar & cement concrete, classification, types and uses.
Protective materials:
Paints-classification, types and uses
Varnishes –. classification, types and uses
Metal – classification, types and uses
Plastics –. classification, types and uses

Unit II: Building Construction **(30 marks)**

Stone masonry- terms used -. Classification – Tools
Brick masonry - Technical terms –-bonds, types junctions
Hollow block construction — types, admixtures added- advantages.
Types of ***Composite masonry.***
Foundation:
Soil - bearing capacity
Foundation - objectives, Requirement,
Types of foundation: ***shallow*** - spread, isolated or column footing, stepped, combined, continuous, inverted arch, cantilever, grillage, & raft or mat foundation; ***Deep foundations*** - piles – Well foundations; Machine foundation-general requirements-types- Cofferdam and caisson

Permanent & temporary structures: life of structures, sub structure, super structure, load bearing structure, cavity wall and framed structure. ***Scaffolding-*** parts, types- ***Shoring-*** types. ***Underpinning***-purpose & types. ***Partition*** –requirements & types. ***Formwork.***
Treatments for building structure: ***DPC***-Sources and effects of dampness and methods. ***Damp proofing materials*** – properties, functions, types. ***Anti-termite treatment***- objectives & uses, method. ***Weathering course***- purpose, materials required. ***Fire-proofing***- Effect and rules. **Arches** - Technical terms- types and centring. ***Lintel*** - types-wooden, brick, stone, steel & RCC.
Carpentry joints terms, classification of joints, Uses & types of fixtures & fastenings **Doors** – Parts, Location, standard sizes, types. ***Windows*** -types. ***Ventilators***-purpose, types. **Floors** – Ground floor & upper floor-Types. **Flooring-** materials used, types.
Stairs – Terms, Requirements, headroom, **Lift escalator , Roofs** & Roof coverings – purposes, Elements, Types; Flat & pitched

Truss-king post, queen post, mansard, bel-fast, steel, composite. ***Shell***-types-north-light & double curved. ***Dome-*** Components and parts.

Unit III: Structural Engineering **(20 marks)**

Introduction, Bar bending , details as per IS Code. Chajjas, Beams and columns, Stairs; One-way slab & two-way slab, Innovative construction Safety against earthquake grade of cement, steel-behaviour & test, bar-bending schedule, Retaining wall, R.C.C. Framed structure. Conmen forms of steel sections, Structural fasteners, Joints tension & compression member- classification, fabrication etc.

Unit IV: House drainage of building **(10 marks)**

Introduction, Terms used in PHE Systems of sanitation, System of house drainage plumbing, sanitary fittings, etc., Purification of water. Types of sewer appurtenance, Systems of plumbing, Manholes & Septic tank. New technology of Plumbing System.

Unit V: Estimating and Costing **(20 marks)**

Introduction, Purpose and common techniques, Construction drawing, Measurement techniques, Estimate-necessity and importance, types-approximate and detailed estimate-main and sub estimates, revised, supplementary, maintenance / repair estimate- taking off quantities - method

Rate analysis and Specifications: Labour and materials, Schedule of rate; Estimating of irregular boundaries by trapezoidal and Simpsons formulae.

Surveying: Introduction and principles; Objectives and uses, common terms used and definitions, classification, accuracy, types, Main divisions (plane & geodetic), Chaining, bearing & meridian.

Speed in field and office work, Plani meter and pantograph; Levelling;
Contouring and Uses of Contour plan and Map.