DCE-301- SURVEY

UNIT :-I

INTRODUCTION OF SURVEY: Definition. Objects of Surveying. Principles of Surveying. Uses of survey, Classification of Surveying.

CHAIN & CROSS STAFF SURVEY**:** Principle of Chain Survey. Study and use of Instruments for linear measurements. Ranging. Chain Triangulation – Survey Station and their Selections, factors affecting selection of survey station. Survey lines, Check lines, Tie lines, base line. Taking offsets. long and short offset, degree of offset. Obstacles in chaining. Chain & cross staff Survey for finding area of a field ,Errors & Corrections in chain & Tape.

UNIT :-II

COMPASS SURVEY: Principle of Compass Survey. Bearing of lines – Meridian. Bearing – forebearing, Back bearing, Whole circle bearing, Quadratral bearing system and Reduced bearing, Conversion of bearings, finding included angles from bearings. Prismatic Compass. calculation of included angles. Traversing – traversing by chain and compass. open traverse, closed traverse. Graphical adjustment for closing error.

UNIT :-III

LEVELLING: Definitions, meaning of various terms used in leveling and its types .Dumpy level – Components, Construction, leveling Staff – Telescopic and folding type .Foresight, back sight, Intermediate sight, Change point, Height of collimation .Fundamental axes and their relationship Recording in level book. Temporary adjustments of dumpy level. Method of Reduction of levels – Height of instrument method and Rise and fall method. Arithmetical checks, Numerical problems, Computation of missing readings. Classifications of leveling. Study and use of tilting level & Auto level. Sources and errors in leveling, precautions and difficulties faced in leveling.

UNIT :-IV

CONTOURING : Definitions – Contour, contour interval, Horizontal equivalent. Characteristics of contours .Method of

locating contours. Interpolation of contours. Establishing grade contours. Uses of Contour Maps. Calculation of reservoir capacity by contour map by trapezoidal and prismoidal formula. Interpretation of Typical Contour Sheets.

UNIT :-V

AREA AND VOLUME MEASUREMENTS : Construction and use of polar planimeter for measurement of area and simple numerical problems. Study and use of Digital Planimete .Concept of computation of Volume by Trapezoidal and Prismoidal formulae.

REFERENCES:-

1Surveying And Levelling N.N.Basak Tata Mc Graw-Hill

2. Surveying And Levelling,Part I And II T .P. Kanetkar & S. V.Kulkarni, Pune Vidhyarthi Griha Prakashan.

3 Surveying And Levelling, Vol. I And II, Dr. B. C. Punmiya Laxmi Plublication.

4 Text Book Of Surveying, S.K.Husain & M.S. Nagaraj, S. Chand And Company.

5 Surveying And Levelling, Vol. I And II S. K. Duggal, Tata Mc Graw-Hill.

6 Plane Surveying, A.M.Chandra, NEWAgeInternationalPublishers.

DCE-302- Material Technology

UNIT :-I

INTRODUCTION : Importance of material Technology for Civil Engineer. Name of common Engineering materials used in construction. MASONARY MATERIALS : a) Building stones- classification, requirement, dressing & quarrying of stones, b) Bricks – properties, method & strength of bricks, testing of bricks, special bricks, hollow blocks, fly ash bricks.

UNIT :-II

BINDING MATERIALS : Murrum, Properties of Murum for Road work. Lime - Types and properties of lime. Cement -Types & Different ingredients used for manufacturing cement with their percentage. Physical properties of cement.

field & laboratory test of cement, storing of cement at site. AGGREGATES**:** Properties of fine & coarse aggregates - Concept of size, shape & surface texture , testing of aggregate. Determination of fineness & grading zone of sand by sieve analysis, determination of silt content in sand & their specification as per IS 383.

UNIT :-III

CONCRETE: Introduction of concrete - Definition of concrete, necessity of supervision for concreting operation, different grades of concrete, water retaining structure & in sea water construction, durability of concrete. Water cement (w/c) ratio, Properties of fresh concrete, factors affecting workability of concrete. creep of concrete. Curing of concrete. Testing of concrete.

UNIT :-IV

TIMBER : Difference between wood and timber. Timber based material: use, types & characteristics of timber, defects in timber.

PAINTS, VARNISHES & COLOURS, Use of paint as protecting surface device for steel surface type of paint used and for wood surface types of paint used. Method of preparation of varnish, component materials used in varnish Distempers and cement paints.

UNIT :-V

STEEL AND ALUMINIUM PRODUCTS : Steel used as Engineering Material in different shapes. Aluminum : Used as construction materials. Miscellaneous materials: glass, plastic- P.V.C. pipes used as materials in pipe laying for water supply purposes, Irrigation etc. Water tanks. fibers, aluminum, steel , galvanized iron, asphalt bitumen etc. micro silica, PVC, CPVC, PPF. Waterproofing and termite proofing materials, admixtures in concrete, bonding agents, epoxy resins, Polishing materials etc. readymade concrete cover. Readymade ornamental material (wall papers, carpets, radium prints, blocks etc.)

REFERENCES.

1Engineering Materials By Rangwala
2.Engineering Materials By Deshpande
3 Engineering Materials By Ojha
4 Engineering Materials By Surendra Singh
5 Building Materials By S.K. Duggal

DCE-303- Building Construction

UNIT :-I

BUILDING COMPONENTS AND MATERIALS : Building components and types of structure - building components & their
function. Substructure – foundation, plinth. Superstructure – walls, sill, lintel, doors & windows, floor, roof, parapet, beams, columns. Types of structures – load bearing structures, Framed structures, composite structures.

UNIT :-II

CONSTRUCTION OF SUB STRUCTURE : Job layout – necessity and procedures, site clearance, preparing job layout, layout for load bearing structure and framed structure by center line And face line method, precautions while marking layout on ground. Earthwork - excavation for foundation, timbering and strutting, earthwork for embankment, material for plinth filling. Tools and plants used for excavation and earthwork. Foundation - importance and necessity, types of foundation, Selection of foundation. Pumping method of dewatering, cofferdams. Bearing capacity of foundation soil, under reamed pile Foundation.

UNIT :-III

CONSTRUCTION OF SUPER STRUCTURE : stone masonry – terms used in stone masonry- point to be observed in construction of stone masonry, mortars for stone masonry, tools and plants used for Stone masonry, col-grout masonry. Brick masonry : common terms used in brick masonry, requirements of good brickwork, bonds in brick masonry. Brick laying ,line level and plumb of brickwork, striking and raking of joints, lead and lift, precautions in brick masonry, tools and plants used in brick masonry. Hollow concrete block masonry, composite masonry,
Doors and windows: doors –components, types & Sizes of door & window – as per IS specification. Protective treatment for doors and windows,
staircase - types of stairs , Scaffolding and shoring: purpose, types of scaffolding, process of erection and dismantling, Merits and demerits.

UNIT :-IV

BUILDING FINISHES : *floors and roofs* - floor finishes, brick flooring, flag stone, Shahabad , Kota, marble, granite, tiles, pavement blocks, skirting and dado. Process of laying and construction, finishing and polishing of floors.
Roofing materials – AC sheets ,GI sheets, plastic sheets, fiber sheets, Mangalore tiles etc. Steel trusses. R.C.C. slab, lean to roof, trusses. *Wall finishes*: plastering – necessity of plastering, Neeru finishing and pop, special plasters - stucco plaster, plaster board and Wall claddings. Precaution to be taken while plastering. Defects in plaster. *Pointing*, Difference between

plastering and pointing. *Painting* – necessity, surface preparation, method of application, selecting suitable painting material, white Wash and colour wash. cracks, identification and repair of cracks. Guniting and grouting,
use of epoxy and crack fills. *Settlement* - causes and remedial measures plinth protection – necessity and materials used.

UNIT :-V

SAFETY AND ENVIRONMENTAL ASPECTS : Safety precautions to be observed during the construction viz. trenching,
digging pits for foundation using machineries, masonry works, erection, scaffolding, centering etc. Environmental consideration to be observed during construction of a building e.g. laying out ofdrainage line and water supply line, soak pit, septic tank, precautions to be taken during site clearance considering environmental effect. Avoiding unnecessary cutting of bushes and tress etc.

REFERENCES

1Building Construction,	S. P. Arora andBindra,	Dhanpat RaiPublication
2. Building Construction,	S. C. Rangawala	Charotar Publication
3 Building Construction,	Sushil Kumar,	Standard Publication
4 Building Construction,	B. C. Punmia	Laxmi Publication
5 Building Construction,	S.K. Sharma,	Tata McGraw-Hill
6 Building Construction,	Dr.Janardan Zha,	khanna Publication
8 Practical Civil Engineering	Handbook,	Khanna Publication

LIST OF EXPERIMENTS:

1 Preparing foundation plan and marking on ground layout of load bearing structure by face line method from the given plan of the building.

2 Preparing foundations plan and marking on ground layout of framed structure by face line method from the given plan of the building.

3 Checking and transferring line and level of plinth, sill, lintel, flooring, slab level of a building and writing report of the process.

4 Checking verticality (plumb line) of formwork for column, beam and wall at construction site and writing report of the process.

5 Observing and writing report of the process of plastering.

6 Observing and writing report of the process of water proofing of terrace or basement.

7 Observing the models, specimen of building materials kept in the model room for few building items and writing a report for any five models/materials.

8 Visit to a building where slab casting is in progress.

9 Use of water level, plum bob, sprit level, Thread, gunia, etc.

10 Study and use of various tools used in building construction.

DCE-304- HYDRAULICS

UNIT :- I

PROPERTIES OF FLUID : Definition of fluid, Difference in behavior of fluid with respect to solids. Introduction to fluid mechanics and hydraulics, Branches of hydraulics- Hydrostatics and hydrodynamics, Importance of Hydraulics with respect to Irrigation and Environmental engineering. Physical properties of fluid Mass density, Weight density, Specific volume, Specific gravity, Surface tension and capillarity, Compressibility, Viscosity, Newton's law of viscosity – Dynamic and kinematics viscosity. Ideal and Real liquids.

UNIT :-II

HYDROSTATIC PRESSURE : Free liquid surface, Definition of pressure and its SI unit, Hydrostatic pressure at point, Pascal's law, Variation of pressure in horizontal and vertical direction in static liquid, Pressure diagram. Total hydrostatic pressure and center of pressure.

MEASUREMENT OF LIQUID PRESSURE IN PIPES **:** Concept of pressure head and its unit, Intensity of pressure, Variation of pressure with depth of liquid, Types of pressure- atmospheric gauge and absolute pressure. Conversion of pressure head of one liquid in to other, devices for pressure measurements in pipes – Piezometer, manometer, Bourdon's pressure gauge. Principle of working and limitations.

UNIT :- III

FUNDAMENTALS OF FLUID FLOW : Concept of flow, Gravity flow and pressure flow. Types of flow – steady and Unsteady, uniform and non-uniform , Laminar and turbulent. Various combinations of flow with practical examples, Reynolds number and its application, Stream line and equi-potential line. Flow net and its uses. Discharge and its units, Continuity equation for fluid flow. Various forms of energies present in fluid flow-potential, kinetic, & pressure energy. Datum head, pressure head, velocity head and total head, Bernoulli's theorem, its assumptions and limitations. Loss of head and modified Bernoulli's theorem. Application of Bernoulli's theorem.

UNIT :- IV

FLOW OF LIQUID THROUGH PIPES : Loss of head due to friction, Darcy-Weisbach Equation Friction factor, relative roughness. Common range of friction factor for different types of pipe material. Minor loss of head in pipe flow- loss of head due to sudden Contraction, sudden expansion, gradual contraction & expansion, at entrance and exit of pipes and in various pipe fittings. Pipes in series and parallel, Equivalent pipe – Dupuit's equation.

UNIT :- V

FLOW THROUGH OPEN CHANNEL : Types of channels- artificial & natural, purposes of artificial channel, Different shapes of artificial channels. Geometrical properties of channel section – wetted area, wetted Perimeter, hydraulics radius. Prismatic channel sections, steady- uniform flow through prismatic channel section. Chezy's equation and Manning's equation for calculation of discharge through an open channel, Most economical channel section, conditions for most economical channel sections. Froud's number and its significance. Critical, sub-critical and supercritical flow in channel,

Hydraulic jump its occurrence in field, uses of hydraulic jump, Flow Measuring Devices.

REFERENCES.

S.No.	Title Author	Publisher
1 Hydraulics & Fluids Mechanics,	Dr. P.N.Modi & Dr.S.M.Seth,	Standard BookHouse, Dehli.
2. Hydraulics & Fluids Mechanics,	S.Ramamrutham,	Rai & Sons,Delhi.
3 A Text Book of Hydraulics,	R.S.Khurmi.	
4 Fluids Mechanics & Hydraulics Machines	S.Chand & CompanY S.Chand & Company Ltd. New, Delhi.	
5A Text Book of Fluids MechanicsHydraulics Machines,	R.K.Rajput,S.Chand	
6 Fluids Mechanics & Hydraulics,	Dr. Jagdish Lal,	Metropolitan Book Co. Private Ltd. New Delhi.

Name of Experiment

1Measurements of pressure and pressure head by Piezometer, U-tube manometer.
2Measurement of pressure difference by U-tube differential manometer. Study of bourdon's gauge.
3 Verification of Bernoulli's theorem.
4 Reynolds experiment to study types of flow.
5 Determination of Darcy's friction factor for a given pipe.
6 Determination of Minor losses in pipes (any two).
7Determination of Manning's constant or Chezy's constant for given rectangular channel section.
8 Demonstration of Hydraulic jump.
9 Determination of coefficient of discharge for given rectangular or triangular notch.
10 Determination of coefficient of discharge for a given Venturimeter.
11 Demonstration and use of Pitot tube and current meter.
12 Determination of hydraulic coefficients for sharp edge orifice.
13 Study & use of water meter.
14 Study of a model of centrifugal and reciprocating pump.
15 Use of characteristic curves/ charts / catalogs from manufactures for selection of pump for the designed discharge

DCE-305- BUILDING DRAWING

UNIT-I

CONVENTIONS : Conventions as per IS:962-1967 and other practices Types of Lines – Visible line, Centerline, Hidden line, Section line, Dimension line, Extension line, Pointers, Arrow heads or dots. Dimensioning systems. Symbols – Materials used in construction, building components. Reading of available ammonia prints of residential buildings.

UNIT-II

2 PLANNING OF BUILDING : Principles of planning of Residential and Public building. Space requirements and norms for
various units of Residential and Public building. Rules and byelaws of local governing authorities for construction. Drawing of line plans for Residential and Public building

UNIT-III

3 BUILDING DRAWING : Development of plan from line plan of a residential building, Elevation, Section, Site plan, Location Plan, Foundation plan, Area statement and other details. Submission Drawing and Working Drawing.

UNIT-IV

4 DETAILED DRAWING : Drawing of staircase, drawing of steel truss & lean to roof, drawing of layout plan of water supply line with accessories. Layout plan of sanitary line - position of inspection chamber, septic tank, sanitary fittings. Position of wash basin, sink etc.

UNIT-V

5 PERSPECTIVE DRAWING : Definition, Necessity, Principles of Perspective Drawing, Terms used in perspective drawing, Two point perspective view of a small object like pedestal, step block, small single storied building with flat roof etc.

REFERENCES

1 Text Book of BuildingDrawing, Shah, Kale & Patki
2. Elements of Building Drawing, D. M. Mahajan
3 Planning and Design of Building Y. S. Sane
4 Civil Engineering Drawing Malik & Meo, New Asian Publishers New Delhi .
5 Building Drawing,. V.B.Sikka

LIST OF EXPERIMENTS

1Drawing various types of lines, lettering and symbols of materials, doors and windows etc. Used in construction on Full Imperial size drawing sheet.

2Drawing the lines plans of following buildings on Full Imperial size graphpaper.
3Residential Building (Min. three rooms)

4Public Building – School building, Primary health center / Hospital building, Bank, Post Office, Hostel building etc.(At least four)

5 Measured Drawing of an existing residential Building (Load bearing/ Framed structure Type) , showing Plan , Elevation, Sections, Construction notes, Schedule of openings, Site Plan, Area statement etc.

6 Submission Drawing of two storied residential building (Framed structure type) showing Plans , Elevation, Sections, Foundation Plan ,construction notes, Schedule of openings, Site Plan ,Area statement etc.

7 Working drawing of above drawing sheet preferably one plan, section through stair case to scale 1:50

8 Two point perspective view of a building drawn in submission drawing.

9 Tracing of a submission drawing prepared at Sr. No.4 above.

10 Ammonia print of submission drawing prepared at Sr. No.4 above.