

DCE-601
PUBLIC HEALTH ENGINEERING
UNIT-I

Introduction: Duties of P.H. Engineer, Need and importance of P.H.E.

UNIT-II

Quantity of Water & Source of water : Demands of water: Domestic, Industrial, Commercial & Institutional, Public use, Losses and wastes, Fire demand ;Factors affecting rate of Demand, Variations of water demands, Forecasting of population, Methods of forecasting of population, Design period for water supply scheme. Estimation of quantity of water supply required for a town or city, Types of water supply schemes

Source of water: Surface and Subsurface sources of water, Ground water, Open well, Tube-Well, infiltration well, infiltration gallery, infiltration pipes. Construction of dug well. Construction of tube well, Well Testing. Yield of well., Intake Structures-Definition and types, Factors governing the location of an intake structure, Water conservation, Ground water recharging – Necessity Importance and advantages

UNIT-III

Quality of Water & Purification of Water: Effect of different impurities on water, surface/ground water, Water borne disease. Need for analysis of water, Characteristics of water-Physical, Chemical and Biological, Testing of water for Total solids, hardness, chlorides, dissolved Oxygen, pH, Bacteriological tests, Sampling of water, Water quality standards as per I.S.

Purification of Water : Screening- Types of screens, Aeration- objects and methods of aeration, Plain sedimentation, Sedimentation with coagulation, principles of coagulation, types of coagulants, Jar Test, process of coagulation, types of sedimentation tanks, Filtration theory of filtration, classification of filters : slow sand filter, rapid sand filter, pressure filter, domestic filter, filter media, construction and working of slow sand filter and rapid sand filter, Disinfection: Objects, methods of disinfection, Chlorination- Application of chlorine, forms of chlorination, types of chlorination practices, residual chlorine and its importance, Flow diagram of water treatment plants,

UNIT-IV

Building Sanitation : Importance and necessity of sanitation, Necessity to treat domestic sewage, Recycling and Reuse of domestic waste Definitions Sewage, sullage, types of sewage, Definitions of the terms related to Building Sanitation-Water pipe, Rain water pipe, Soil pipe , Sullage pipe, Vent pipe, Building Sanitary fittings- Water closet – Indian and European type, flushing cistern, wash basin, sinks, Urinals, Traps- types, Systems of plumbing – one pipe, two pipe, single stack, layout

plan for building sanitary fittings (drainage plan) , inspection and junction chambers, their necessity, location

UNIT-V

Rural Sanitation: Environmental Sanitation Necessity and importance, rural sanitation- Types of Privies – Aqua privy and Bore Hole Latrine construction and working Composting (Nadep or Vermiculture).

LIST OF REFERENCE BOOKS:

1. Text Book of Water supply and sanitary Engg. Husain. S.K. Oxford and IBH publishing Co. NewDelhi
2. Water supply and Sanitary Engg. Birdie, G.S. and Bridie, J.S. Dhanpat Rai & Sons, Delhi
- 3 Jal Apurti Evam Swachchhata Engg. Sunil and Rajjan Navbhart Prakashan, Meerut
- 4 Water Supply & Sanitary Engg. Gurucharan Singh Standard Publishers
- 5 The committee on PHE Manual and code of practice, The Ministry of Health, Govt. of India, “PHE Manual and code of practice – Sections, I, II, III and IV

DCE-602
QUANTITY SURVEYING & COSTING-II

UNIT-I

Estimate of R.C.C. Structure: Estimate of slab, beam, T-beam. Estimate of R.C.C. column with its footing. Preparation of Abstract of above items. Preparation of Bar bending schedule, and to calculate amount of steel

UNIT-II

Estimate of Steel / Timber Structures: Estimate of steel column (Stanchion) Estimate of steel Truss and Gusset Plate. Estimate of Roof covering materials.G.I. Roof, A.C. Roof. Estimate of steel frames for Doors & Windows. Estimate of Wooden Doors and Windows. Estimate of Roof Covering materials.

UNIT-III

Estimate of Culverts & Bridges: Estimate of Hume pipe culvert with splayed type of wing wall, Turn wall, and face wall. Estimate of R.C.C. Slab Bridge, straight type wing walls.

UNIT-IV

Estimate of Water Supply and Sanitary Fittings: Detailed Estimate of Water Supply for building work. Detailed Estimate of Sanitary works for building work. Estimate of S.W. pipe line. Estimate of Septic Tank.

UNIT-V

Valuation & Rent Fixation: Definition, Necessity of Valuation. Definition, Cost price, Value, Difference between them. Types of value, Book value, scrap value, salvage value, Market value, Depreciation, obsolescence, Sinking fund. Methods of calculation of depreciation, straight line method, sinking fund method constant percentage method, quantity survey method. Computation of capitalized value, Gross income, outgoing, net income, Years purchase. Types of outgoing and their percentages. Valuation of Lands & Buildings, factors affecting their valuation, Fixation of Rent as per PWD practice.

LIST OF REFERENCE BOOKS:

1. Estimating and costing By. B.N. Dutta S.Datta & Co. Tagroe Path Motilal Bose Road, Lucknow.
2. Estimating and costing & Valuation By Rangwala Charotar Publications Station Road, Anand
- 3 Estimating & Costing By Birdie, J.C, Kapoor Dhanpat Rai & Sons Delhi and Jullundur.
- 4 Estimating & Costing Vol-I & Vol.-II By J.C. Malhotra Khanna Publishers 2B, Nath Market, Nai Sarak New Delhi

DCE-603

STRUCTURAL DESIGN & DRAFTING-II (STEEL)

UNIT-I

Introduction : Types of sections used, Hollow Square section Rectangular section Tubular section, Z Section, Angle Section, T,I,C,L Section etc. Grades of steel and strength characteristics; advantages and disadvantages of steel as construction material; Use of steel table and relevant I. S. code; Types of loads on steel structure and its I. S. code specification.

UNIT-II

Connections: Riveted connections, Types of rivets and their use, Nominal dia, Gross dia. Unwin's formula, Pitch of rivets, Edge distance, Tacking rivets, and permissible stress in rivet riveted joint and its failure, Strength of riveted joint and efficiency of a riveted joint. Assumptions in theory of riveted joint, Design of riveted joint for axially loaded member. Eccentric riveted connection Welded connection Introduction, Permissible stress in weld, strength of weld, advantages and disadvantages of welded joint. Types of weld and their symbols. Design of fillet weld and butt weld subjected to axial load.

UNIT-III

Tension member: Types of Sections used, Permissible Stresses in Axial Tension, gross and net cross sectional area of tension member, Analysis and design of tension member with welded and riveted connection.

UNIT-IV

Compression Member: Criteria of failure of short column and long column, end conditions Effective length of a column, slenderness ratio and corresponding compressive stress: Angle struts Types of sections used, Analysis and Design of axially loaded angle struts with welded and riveted connection. Stanchion and Columns, types of sections used, simple and built up sections. Analysis and design of axially loaded column. Design of compound column. Design of lacing angles and Batten plates.

UNIT-V

Column Bases: Types of column bases, design of slab base & concrete block. Cleat angles, their use and introduction to gusseted base (no numerical problems on gusseted Base)

Timber Structures: Grades of Timber – stress in timber. Factors affecting stress/strength of timber. Design of Timber column & Timber Beam.

LIST OF EXPERIMENTS

: Term work shall consist of sketch book and design report of steel roof truss for an industrial building. Sketch book shall consist of any five plates out of the below mentioned

1. Sketching of different types of riveted joints and welded joints. Typical sketches of sections of tension member, determination of net effective cross-sectional area of tension member for angle section.
2. Typical sketches of sections of compression member, lacing and battening.
3. Graphical solution of frames to find out the stress in the member. Type of trusses for different spans.
4. Working drawing of steel truss with the details of joint
5. Detailed drawing of slab base and gusseted base.
6. Important information of clauses of IS800-1984 and IS875

LIST OF REFERENCE BOOKS

- 1 Steel structures By Ramanatham
2. Structural Engg. Vol.-IV (Steel) By Vazirani
- 3 Steel Structures By Ram Chandra
- 4 Steel Structures By Arya and Ajmani
- 5 Steel Structures By Malhotra M.M.
6. I.S. Code 800-1984
7. Steel Structures By R.K. Dhoble & D.S. Dharmadhikari
8. Steel Structures Negg.

DCE-604
Soil Mechanics-II

Unit - I

Basic Definitions & Index Properties: Definition and scope of soil mechanics, Historical development. Formation of soils. Soil composition. Minerals, Influence of clay minerals on Engineering behaviour. Soil structure. Three phase system. Index properties and their determination. Consistency limits. Classification systems based on particle size and consistency limits.

Unit - II

Soil Water and Consolidation: Soil water, Permeability Determination of permeability in Laboratory and in field. Seepage and seepage pressure. Flow nets, uses of a flow net, Effective, neutral and total stresses. Compressibility and consolidation, Relationship between pressure and void ratio, Theory of one dimensional consolidation. Consolidation test, Fitting Time curves. Normally and over consolidated clays. Determination of reconsolidation pressure, settlement analysis. Calculation of total settlement.

Unit – III

Stress Distribution in Soils and Shear Strength of Soils: Stress distribution beneath loaded areas by Boussinesq and water guard's analysis. New mark's influence chart. Contact pressure distribution. Mohr - Coulomb's theory of shear failure of soils, Mohr's stress circle, Measurement of shear strength, Shear box test, Triaxial compression test, unconfined compression test, Value shear test, Measurement of pore pressure, pore pressure parameters, critical void ratio, Liquefaction.

UNIT-IV

Shallow Foundations: Type of foundations shallow and deep. Bearing capacity of foundation on cohesion less and cohesive soils. General and local shear failures. Factors effecting B.C. Theories of bearing capacity - Prandle, Terzaghi, Balla, Skempton, Meyerh of and Hansan. I.S. code on B.c. Determination of bearing capacity. Limits of total and differential settlements. Plate load test.

UNIT-V

Deep Foundation: Pile foundation, Types of piles, estimation of individual and group capacity of piles in cohesion less and cohesive soils. Static and dynamic formulae.. Pile load test, Settlement of pile group, Negative skin friction, under- reamed piles and their design. Piles under tension, inclined and lateral load Caissons. Well foundation. Equilibrium of wells. Analysis for stability tilts and shifts, remedial measures.

LIST OF EXPERIMENTS

1. Indian Standard Light Compaction Test/Std. Proctor Test
2. Indian Standard Heavy Compaction Test/Modified Proctor Test
3. Determination of field density by Core Cutter Method
4. Determination of field density by Sand Replacement Method
5. Determination of field density by Water Displacement Method
6. The corifiled Compression Test
7. Triaxial compression test
8. Lab. Vane Shear test
9. CBR Test
10. Demonstration of Plate Load Test SPT & DCPT

REFERENCE BOOKS: --

1. Soil Mechanics & Foundation Engg. by Dr. K.R. Arora - Std. Publishers Delhi
2. Soil Mechanics & Foundation Engg. by B.C. Punmia - Laxmi Publiscations Delhi
3. Modern Geotech. Engg. by Dr. Alam Singh-IBT Publishers Delhi.
4. Geotech. Engg. by C.Venkatramaiah-New AGE International Publishers, Delhi
5. Found. Engg. by GALEonards McGraw Hill Book Co. Inc. 6. Relevant IS Code

DCE-605
Major Project

UNIT- I

Introduction: Importance of project work, guide line and general introduction.

UNIT-II

Selection of Project: The project can be selected from any four civil engineering system like Building construction system, transportation engineering system, irrigation engineering system. A topic for project can also be selected on recent development in civil engineering.

UNIT-III

Planning of project: Planning of field work, line of action, work distribution, data to be collected by different batches. Projects to be undertaken by a group of 4 to 6 students

UNIT-IV

The project report shall be in the following format:

- Topic and objectives
- Collection of data, required survey work,
- Management and construction procedure
- Resources scheduling and networking
- Design details
- Required drawing set
- Utility to society if any
- Conclusion