ShriJagdishprasadJhabarmalTibrewala University

(Civil Engineering Department)

Detailed Syllabus of Diploma.

SHRI JAGDISHPRASAD JHABARMAL TIBREWALA UNIVERSITY
श्री जगदीशप्रसाद झाबरमल टीबडेवाला विश्वविद्यालय

INSTITUTE OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING
Teaching & Scheme of Examination for Diploma (Civil Engineering)
EFFECTIVE FROM ACADEMIC SESSION 2013-2016

Year: II **Semester: III**

S. No.	Subject Code	Subject Name	Hrs./Week			Exam Hrs.	Maximum & Minimum Marks		
			L	T	P		Internal/ Min. Pass Marks	External/ Min. Pass Marks	Total/Min. Pass Marks
Theory									
1	DCE-301	Strength of Materials –I	3	1	-	3	30/12	70/28	100/40
2	DCE-302	Surveying -I	3	1	-	3	30/12	70/28	100/40
3	DCE-303	Transportation Engineering- I	3	1	-	3	30/12	70/28	100/40
4	DCE-304	Soil Engineering	3	1	-	3	30/12	70/28	100/40
5	DCE-305	Fluid Mechanics-I	3	1	-	3	30/12	70/28	100/40
6	DCE-306	Construction Materials	3	1	-	3	30/12	70/28	100/40
Practical's									
7	DCE-307	Transportation Engineering Lab	-	-	3	3	40/16	60/24	100/40
8	DCE-308	Surveying Lab-I	-	-	3	3	40/16	60/24	100/40
9	DCE-309	Fluid Mechanics Lab	-	-	3	3	40/16	60/24	100/40
10	DCE-310	Strength Of Materials Lab	-	-	3	3	40/16	60/24	100/40
		Total	**18**	**6**	**12**				**1000**
		Total Teaching Load	**36**						

DCE-301 STRENGTH OF MATERIALS- I

1. Simple Stress and Strain:

1.1. Various mechanical properties
- 1.1.1. Elasticity
- 1.1.2. Plasticity
- 1.1.3. Ductility
- 1.1.4. Brittleness
- 1.1.5. Toughness
- 1.1.6. Hardness

1.2. Concept of stress and strain
- 1.2.1. Type of force - Direct, shear
- 1.2.2. Stress - Tensile, compressive, shear

1.3. Hook's law
- 1.3.1. Statement of Hook's law
- 1.3.2. Young's modulus of elasticity
- 1.3.3. Tensile test diagram
  - 1.3.3.1. Gauge length
  - 1.3.3.2. Limit of proportionality
  - 1.3.3.3. Elastic limit
  - 1.3.3.4. Yield point, Yield strength
  - 1.3.3.5. Ultimate stress
  - 1.3.3.6. Bar of composite section
  - 1.3.3.7. Rupture strength
  - 1.3.3.8. Nominal stress
  - 1.3.3.9. Proof stress

1.4. Working stress and factor of safety

1.5. Stress and strain calculations
- 1.5.1. Principle of superposition
- 1.5.2. Bar of homogeneous section
  - 1.5.2.1. Bar of uniform cross-section
  - 1.5.2.2. Bar of steeped cross-section

1.6. Temperature stresses
- 1.6.1. Homogeneous section
- 1.6.2. Composite section

1.7. Shear stresses
- 1.7.1. Modulus of rigidity
- 1.7.2. Complementary shear stress
- 1.7.3. Concept of single shear& double shear
- 1.7.4. Shear strain

1.8. Poisson's ratio and volumetric strain
- 1.8.1. Lateral strain
- 1.8.2. Longitudinal strain
- 1.8.3. Volumetric strain
- 1.8.4. Bulk modulus

1.9. Relationship between elastic constants (Derivation)
- 1.9.1. E=3K(1-2/m)
- 1.9.2. E=2N(1+1/m)
- 1.9.3. E=1KN/(3K+N)

2.Compound Stress:

2.1 Introduction

2.2 Stress components on an inclined plane

2.2.1 Induced by direct stresses

2.2.2 Induced by simple shear

2.2.3 Induced by direct and simple shear stresses

2.3Mohr's circle:
- 2.3.1For like direct stresses
- 2.3.2For unlike direct stresses
- 2.3.3For two perpendiculars direct stresses with state of simple shear

2.4Principal stresses and planes
- 2.4.1Major principal stress
- 2.4.2Minor principal stress
- 2.4.3Mohr's circle method for principal stresses

3. Strain Energy:

3.1 Introduction

3.2 Strain energy from stress - strain diagram

3.3 Proof resilience

3.4 Types of loading - gradual, sudden, impact

3.4.1 Stress in gradual loading

3.4.2 Stress in sudden loading

3.4.3 Stress in impact loading

4. Bending Moments and Shear Force:

4.1 Basic concept

4.1.1 Types of support

4.1.1.1 Movable hinge support (roller)

4.1.1.2 Immovable hinge support

4.1.1.3 Fixed support

4.1.2 Types of beam

4.1.2.1 Cantilever beam

4.1.2.2 Simply supported beam

4.1.2.3 Fixed beam

4.1.2.4 Continuous beam

4.1.2.5 Overhanging beam

4.1.3 Types of load

4.1.3.1 Point load

4.1.3.2 Distributed load - uniformly and non uniformly

4.2 Shear force and bending moment

4.2.1 Concept and calculation of shear force and bending moment

4.2.2 Sign convention for shear force and bending moment

4.3 Bending moment and shear force diagrams (for point loads, U.D.L. and their combinations)

4.3.1 Cantilever beam

4.3.2 Simply supported beam

4.3.3 Simply supported beam with over hang

5. Moment of Inertia:

5.1 Concept of moment of Inertia

5.2 Radius of gyration

5.2.1 Parallel axis theorem

5.2.2 Perpendicular axis theorem

5.3 Moment of Inertia of various section

5.3.1 Rectangle

5.3.2 Triangle

5.3.3 Circle

5.4 Moment of inertia of unsymmetrical section like: T-section, channel section, L-section etc.

6. Bending Stresses in Beams:

6.1 Concept of bending stress

6.2 Theory of simple bending

6.2.1 Assumptions in theory of simple bending

6.2.2 Use of equation with proof)

6.3 Design criterion and section modulus

6.3.1 Section modulus

6.3.2 Calculation of max bending stress in beams of rectangular, circular, I and T section

7. Shear Stress in Beams:

7.1 Concept

7.2 Use of equation □(with proof)

7.3 Shear stress distribution diagram of various sections

7.3.1 Rectangle

7.3.2 I section

7.3.3 T section

7.3.4 Channel section

7.3.5 H section

7.3.6 Circular section

DCE-302 SURVEYING- I

Introduction:

1.1 Plane surveying and geodetic surveying

1.2 Uses of surveying in engineering.

1.3 Principles of surveying

2. Chain Surveying :

2.1 Different types of chains

2.1.1 Metric chain

2.1.2 Engineer's chain

2.1.3 Gunter's chain

2.1.4 Revenue chain

2.2 Types of Tapes

2.2.1 Linen tapes

2.2.2 Metallic tapes

2.2.3 Invar tapes

2.2.4 Steel band

2.3 Ranging rods

2.4 Offset rods
2.5 Line ranger
2.6 Cross staff
2.7 Optical square
2.8 Arrows
2.9 Folding, unfolding, of chains
2.10 Testing and adjusting of chains
2.11 Ranging
    2.11.1 Direct ranging
    2.11.2 Indirect ranging
2.12 Chaining on plane ground,
2.13 Conventional signs in surveying
2.14 Recording in field book
2.15 Chaining on sloping ground
    2.15.1 Direct method
    2.15.2 Indirect method
2.16 Common errors and precautions
2.17 Traversing
2.18 Fixing and marking stations
2.19 Base line, Check lines and Tie lines
2.20 Common obstacles in chaining
2.21 Plotting of traverse

3. Compass Surveying :

3.1 Prismatic compass
3.2 Surveyor's compass
3.3 Difference in the above two compasses
3.4 Definitions
    3.4.1 Meridian - magnetic, true, arbitrary
    3.4.2 Magnetic dip
    3.4.3 Magnetic declination
    3.4.4 Fore bearing
    3.4.5 Back bearing
3.5 Whole circle bearing system
3.6 Quadrilateral bearing system
3.7 Conversion from whole circle bearing to quadrilateral bearing and vice versa.
3.8 Reading the bearing of lines
3.1 Computation of internal angles
3.1 Distribution of instrumental error
3.2 Local attraction
3.3 Correction of bearings due to local attractions
3.4 Traversing with chain and compass
    3.4.1 Open traverse
    3.4.2 Closed traverse
3.14 Booking in field book
3.15 Adjustment of error in a closed traverse

4. Minor Instrument :

4.1 Study and uses of
    4.1.1 Hand level
    4.1.2 Abney level
    4.1.3 Clinometer
    4.1.4 Planimeter
    4.1.5 Pantagraph
    4.1.6 Sextent
    4.1.7 Cylonghat tracer

5. Traverse :

5.1 Types - open and closed traverse
5.2 Methods of traversing
    5.2.1 Traversing by included angles
    5.2.2 Traversing by deflection angles
5.3 Latitudes and departures
5.4 Balancing of a traverse by
    5.4.1 Bowditch's rule
    2.4.2 Transit rule
    5.5 Omitted measurements

6. Tacheometry :

6.1 Concept
6.2 Methods
    6.2.1 Stadia methods
    6.2.2 Tangential methods
6.3 Anallatic lens

6.4 Determination of horizontal and vertical distances by
    6.4.1 Staff vertical
    6.4.2 Staff normal to the line of sight
6.5 Substance bar

DCE-303TRANSPORTATION ENGINEERING- I

1. Introduction :

1.1 Importance of highway transportation

1.2 Different modes of transportation

1.3 Scope of highway engineering

2. Highway Development and Planning :

2.1 Historical development of road construction

2.2 Necessity of highway planning

2.3 Classification of roads

2.4 Road pattern

2.5 Highway planning in India

3. Highway Geometric Design :

3.1 Highway alignment and basic consideration governing alignment for a road

3.2 Glossaries of terms used in road geometric and their importance

3.3 Highway cross section elements

3.4 Sight distances

3.5 Design of horizontal alignments

3.6 Design of vertical alignments

4. Traffic Engineering :

4.1 Scope of traffic engineering

4.2 Passenger car unit (PCU)

4.3 Traffic control devices - signs, signals, marking, traffic islands

4.4 Causes and precaution of road accidents

4.5 On street and off street parking

4.6 Highway lighting

5. Highway Materials :

5.1 Subgrade soil

- 5.1.1 Desirable properties
- 5.1.2 Highway research board classification of soils
- 5.1.3 CBR test

5.2 Stone aggregates

- 5.2.1 Desirable properties
- 5.2.2 Attrition and abrasion tests
- 5.2.3 Crushing test
- 5.2.4 Impact test
- 5.2.5 Shape test

5.3 Bituminous materials

- 5.3.1 Penetration test
- 5.3.2 Softening point test
- 5.3.3 Ductility, flash and fire point
- 5.3.4 Specific gravity test

6. Construction of Roads :

6.1 Introduction

6.2 Water Bound Macadam roads

6.3 Bituminous roads

6.4 Cement concrete road

7. Highway Maintenance :

7.1 Common types of road failures

7.2 Routine maintenance

8. Road Drainage and Road Arboriculture :

8.1 Necessity of road drainage

8.2 Surface and sub surface drainage

8.3 Object of road arboriculture

8.4 Common roadside trees

8.5 Plantation and protection of trees

1. Bridges:

1.1 Introduction: Classification of bridges

- 1.1.1 Temporary bridges
- 1.1.2 Permanent bridges

1.2 Selection of site of the bridges

1.3 Economical span of the bridges, calculation of discharge, velocity, afflux by various methods

1.4 Cause ways, culverts - brief description with sketches

1.5 Brief introduction to piers, abutments, wing walls and bearing.

DCE-304 SOIL ENGINEERING

1. Introduction:

1.1 Introduction and scope of soil engineering

1.2 Origin and formation of soils

1.3 Major soil deposits of India

2. Fundamental Definitions and Relationships:

2.1 Representation of soil as a three phase system

2.2 Definition of moisture content, unit weights, density, and specific gravity, void ratio, porosity, degree ofsaturation and the relationship among them.

3. Classification of Soils:

3.1 Classification of soils as per particle size and plasticity chart according to IS specifications

3.2 Particle size distribution - Sieve analysis

3.3 Consistency of soils – Liquid limit, Plastic limit and Shrinkage limit

3.4 Field identification of soil

4. Permeability of Soils:

4.1 Definition of permeability and related terms

4.2 Darcy's law of flow through soils

4.3 Factors affecting permeability

4.4 Measurement of permeability in laboratory

4.5 Measurement of permeability in field

5. Compaction:

5.1 Process of compaction

5.2 Proctor's compaction test

5.3 Moisture content and density relationships

5.4 Factors affecting compaction

5.5 Different methods of compaction

5.6 Brief description of field compaction methods, equipments and suitability for different type of soils.

6. Consolidation :

6.1 Meaning and explanation of phenomena

6.2 Total stress, neutral stress and effective stress

6.3 Measurement of compressibility characteristics

6.4 Consolidation test

6.5 Pressure void ratio relationship in consolidation

6.6 Practical methods of accelerating consolidation

6.7 Normally consolidated and over consolidated soil

7. Shear strength :

7.1 Concept of shear strength

7.2 Factors contributing to shear strength of soils.

7.3 Drainage conditions of testing.

7.4 Determination of shearing strength by direct shear test, unconfined compression test, vane shear test.

8. Bearing Capacity:

8.1 Concept of bearing capacity

8.2 Terzaghi's beating capacity factors and bearing capacity as per IS code

8.3 Factors affecting bearing capacity.

8.4 Determining bearing capacity of soil by plate load test and Standard Penetration Test.

8.5 Methods of improving bearing capacity

9. Earth Pressures:

9.1 Active and passive earth pressure

9.2 Earth pressure at rest

9.3 Determination of earth pressure by Rankine's theory for cohesion less soil (No derivation)

10. Soil Exploration:

10.1 Functions and scope of soil exploration

10.2 Excavation and boring methods of sub-surface exploration

10.3 Types of samplers

10.4 Disturbed and undisturbed samples

10.5 Leveling, sealing and preservation of samples

DCE-305 FLUID MECHANICS- I

1. Introduction:

1.1 Introduction concepts

- 1.1.1 Fluids and solids
- 1.1.2 Liquid, gas and vapour

1.2 Fluid mechanics

- 1.2.1 Kinematics
- 1.2.2 Dynamics

1.3 Fluid properties

- 1.3.1 Density
- 1.3.2 Specific volume
- 1.3.3 Specific gravity
- 1.3.4 Viscosity
  - 1.3.4.1 Newton's law of viscosity
  - 1.3.4.2 Dynamic and Kinematic viscosity

1.3.5 Compressibility

1.3.6 Surface tension - soap bubble, drop

1.3.7 Capillarity

1.3.8 Vapour pressure and its importance

2. Fluid Pressure and its Measurement:

2.1 Definition and its units

2.2 Pascal's law

2.2.1 Intensity of pressure at a point in fluid at rest

2.2.2 Pressure head

2.3 Pressure

2.3.1 Atmospheric pressure

2.3.2 Gauge pressure

2.3.3 Vacuum pressure

2.3.4 Absolute pressure

2.3.5 Differentials pressure

2.4 Law of hydrostatic pressure

2.5 Brahma's press

2.6 Pressure measurement

2.6.1 Manometers

2.6.1.1 Piezometer - its limitation

2.6.1.2 U-tube - simple, differential, inverted

2.6.1.3 Micro-manometers

2.6.1.4 Inclined tube micro-manometers

2.6.2 Mechanical gauge

2.6.2.1 Bourdon gauge

2.6.2.2 Bellow gauge

2.6.2.3 Diaphragm gauge

2.6.2.4 Dead weight gauge

3. Hydrostatics:

3.1 Total pressure

3.2 Centre of pressure

3.3 Total pressure and center of pressure in following cases

3.3.1 Plane surface immersed horizontally

3.3.2 Plane surface immersed vertically

3.3.3 Plane surface immersed at an angle

3.3.4 Curved surface (no proof)

3.4 Working of lock gates, sluice gate

3.5 Pressure on masonry dams of rectangular and trapezoidal sections and their condition of stability

4. Hydro kinematics :

4.1 Description of fluid flow

4.1.1 Eular approach

4.1.2 Lagrangian approach

4.2 Definition of path line, stream line

4.3 Types of flow

4.3.1 Steady - Non steady

4.3.2 Uniform - Non uniform

4.3.3 Laminar - Turbulent

4.3.4 One, Two, Three dimensional flow

4.4 Continuity equation (no proof) :

4.4.1 Assumption

4.4.2 Rate of discharge

4.4.3 one dimensional flow

5. Hydrodynamics and Measurement of Flow:

5.1 Energy of fluid - pressure, kinetic and potential

5.2 Bernoulli's theorem (no proof)

5.2.1 Assumptions and its limitation

5.2.2 Conversion of pressure into pressure head, velocity into kinetic head

5.3 Applications of Bernoulli's theorem

5.3.1 Pitot-tube

5.3.2 Venturimeter

5.3.3 Orificemeter

Orifices and Notches:

6.1 Definition and classification

6.2 Discharge through small orifices

6.2.1 Coefficient of contraction

6.2.2 Coefficient of velocity

6.2.3 Coefficient of discharge

6.2.4 Coefficient of resistance

6.3 Time of emptying a vessel of uniform cross section through an orifice at bottom.

6.4 Notches - Classification

6.4.1 Crest, Nappe

6.4.2 Difference between notch and weir

6.5 Flow over -

6.5.1 Triangular notch

6.5.2 Rectangular notch

[Simple numerical problems without velocity of approach]

DCE-306 CONSTRUCTION MATERIALS

1. Building Stone :

1.1 Classification of rocks

1.2 General characteristics of stones

1.3 Requirements of good building stones and their testing

1.4 Identifications of common building stones

1.5 Various uses of stones in construction

2. Bricks and tiles :

2.1 Introduction to bricks

2.2 Raw materials for bricks manufacturing

2.3 Manufacturing of bricks

2.4 Classification of bricks

2.5 Testing of common bricks

2.6 Special bricks

2.6.1Building tiles: Wall, celling, roofing and flooring tiles

2.6.2Ceramic tiles, properties and uses

2.7 Stacking of bricks and tiles at site

3. Cement :

3.1 Introduction, raw material, manufacturing of ordinary Portland cement

3.2 Properties and uses of Portland cement

3.3 Testing of cement

3.4 special cement and their uses

3.5 Storage of cement

4. Lime :

4.1 Introduction: Lime as one of the cementing material

4.2 Natural sources of manufacturing of lime

4.3 Definition of various terms

4.4 Calcination of lime

4.5 Classification of lime

4.6 Testing of lime

5. Timber and wood based products :

5.1 Identification of various timber: teak, deodar, shisham, sal, mango, kail and chir

5.2 Market forms of converted timber

5.3 Seasoning of timber

5.4 Defects in timber, decay in timber

5.5 Preservation of timber and methods of treatment

5.6 Other wood products, their manufacturing and uses

6. Paints and varnishes :

6.1 Purpose and use of paints

6.2 Different types of paints: oil paint, water paint and cement paint

6.2.1 Oil paint: raw material for preparation, properties and uses

6.2.2 Cement paint: properties and uses

6.2.3Varnishes and polish: types, properties and uses

7. Metals :

7.1 Ferrous metals: composition, properties and uses of cast iron, steel, requirement of mild steel

7.2 Non-ferrous metal: Properties and uses of the non-ferrous metals in civil engineering

7.3 Commercial forms of ferrous and non-ferrous metals

7.4 Bond strength

7.5 Aggregate cement bond strength

8. Miscellaneous materials :

8.1 Plastic: Products of plastic material used in civil engineering

8.2 Asbestos products and their uses

8.3 Construction chemicals like: water proofing components, sulphides, polymers

8.4 Water proofing materials: Bitumen sheets and felts, chemical admixtures

8.5 Composite materials

PRACTICAL AND SESSIONALS

DCE-307 TRANSPORTATION ENGINEERING Lab

1. Determination of abrasion value of aggregates by Los Angel's test

2. Determination of impact value of aggregate

3. Determination of crushing value of given aggregates

4. Determination of C.B.R. value of sub grade soil.

5. Determination of penetration value of bitumen

6. Determination of softening point of bitumen.

7. Determination of ductility of bitumen

8. Determination of flash and fire point of bitumen

DCE-308 SURVEYING I Lab

1.Study of the component parts and handling of

1.1 Dumpy level, 1.2 Tilting level, 1.3 Staves

2.Use of Chains :

2.1 Folding and unfolding

2.2 Ranging and chaining on plane and sloping surface

2.3 Setting right angles.

2.4 Setting parallel lines.

2.5 Taking offsets.

2.6 Chain surveying of small areas

2.6.1 Study of prismatic compass

2.6.2 Study of surveyor compass

2.7 Measurements of bearing of lines

2.8 Transverse by compass and adjustment of error

2.9 Study of

2.9.1 Hand and abney level, 2.9.2 Clinometer, 2.9.3 Planimeter, 2.9.4 Pantagraph, 2.9.5 Sextant

2.9.6 Cylonghat tracer

DCE-309 FLUID MECHANICS Lab

1. Study of different types of manometers and pressure gauges

2. Verification of Bernoulli's theorem

3. Determination of C_d for Venturimeter

4 Determination of C_d for Orificemeter

5Determination of C_c,$C_v$and C_d of small orifice

6 Visit of a nearby dam

DCE-310 STRENGTH OF MATERIALS LAB

1. Study of extensometers

2. Study and operation of UTM

3. Tensile test on mild steel specimen and plotting stress strain curve.

4. Bending test on timber beams.

5. Compression test on common structural materials viz. timber, cast iron etc.

6. Determination of toughness of cast iron and mild steel specimen by Charpy and Izod test.

7. Hardness test by Brinell and Rockwell test.

8. Determination of deflection for various types of loading

1. Torsion test on brass and mild steel

1. Determination of stiffness of close coiled spring

INSTITUTE OF ENGINEERING
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Teaching & Scheme of Examination for Diploma (Civil Engineering)
EFFECTIVE FROM ACADEMIC SESSION 2013-2016

Year: II **Semester: IV**

S. No.	Subject Code	Subject Name	Hrs./Week			Exam Hrs.	Maximum & Minimum Marks		
			L	T	P		Internal/ Min. Pass Marks	External/ Min. Pass Marks	Total/Min. Pass Marks
Theory									
1	DCE-401	Strength of Materials-II	3	1	-	3	30/12	70/28	100/40
2	DCE-402	Fluid Mechanics-II	3	1	-	3	30/12	70/28	100/40
3	DCE-403	Surveying-II	3	1	-	3	30/12	70/28	100/40
4	DCE-404	Transportation Engineering -II	3	1	-	3	30/12	70/28	100/40
5	DCE-405	Concrete Technology	3	1	-	3	30/12	70/28	100/40
6	DCE-406	Building Technology-I	3	1	-	3	30/12	70/28	100/40
Practical's									
7	DCE-407	Engineering Mechanics Lab	-	-	3	3	40/16	60/24	100/40
8	DCE-408	Hydraulics Machine Lab	-	-	3	3	40/16	60/24	100/40
9	DCE-409	Surveying Lab-II	-	-	3	3	40/16	60/24	100/40
10	DCE-410	Concrete Lab	-	-	3	3	40/16	60/24	100/40
Total			**18**	**6**	**12**				**1000**
Total Teaching Load			**36**						

DCE-401 STRENGTH OF MATERIALS-II

1. Columns and Struts:

1.1 Concept of column and struts

1.2 Modes of failure

1.3 Types of column; long and short

1.4 Buckling loads

1.5 Slenderness ratio

1.6 Euler's formula (without proof)

- 1.6.1 Both ends hinged
- 1.6.2 One end fixed and other end free
- 1.6.3 Both ends fixed
- 1.6.4 One end fixed and other end hinged
- 1.6.5 Limitations of Euler's Formula
- 1.6.6 Equivalent length

1.7 Rankine's formula

2. Springs :

2.1 Introduction and classification of springs

2.2 Flat carriage springs

- 2.2.1 Application of flat carriage springs
- 2.2.2 Determination of number of leaves and their sections, deflection and radius of curvature
- 2.2.3 Quarter elliptical spring

2.3 Closely coiled helical springs :

- 2.3.1 Application of closely coiled helical springs
- 2.3.2 Determination of deflection, angle of twist, number of coils and stiffness under axial loading in closely coiled helical springs.

3. Thin Cylindrical Shells :

3.1 Use of cylinders

3.2 Stresses due to internal pressure

- 3.2.1 Circumferential stress or hoop stress
- 3.2.2 Longitudinal stress

3.3 Design of thin cylinders - calculation of the various dimensions of a thin cylinder

4. Combined Direct and Bending Stress:

4.1 Effect of eccentricity

4.2 Stress due to eccentric load

4.3 Middle third rule

4.4 Quarter rule

5.TRUSS

5.1 Different type of frame

5.2Calculationofthe forces in the member of determinates frame

- 5.2.1Method of joint
- 5.2.2 Method of section

6. Deflection:

6.1 Concept of deflection of a beam

6.2 Use of standard formula for calculating deflection (for point loads, U.D.L. and their combination)

- 6.2.1 Cantilever beam
- 6.2.2 Simply supported beam

7. Torsion of Shaft:

7.1 Concept of torsion

- 7.1.1 Angle of twist
- 7.1.2 Polar moment of Inertia
- 7.1.3 Assumptions in the theory of pure torsion

7.2 Derivation and use of

7.3 Relation between power and torque

7.4 Combined stress due to bending and torsion in solid and hollow shaft

DCE-402 FLUID MECHANICS-II

1. Flow Through Pipes:

1.1 Laws of fluid friction.

1.2 Losses of head in pipes

1.3 Hydraulic gradient line.

1.4 Total energy line.

1.5 Flow through pipes in series.

1.6 Equivalent length

1.7 Flow through parallel pipes (No branched pipes)

1.8 Flow through siphon

1.9 Definition of water hammer and its effect (No mathematical calculations)

2. Flow through Channels:

2.1 Types of flow

2.1.1 Uniform and Non uniform flow, difference in pipe and channel flow.

2.2 Classification of an open channel

2.3 Formula for uniform flow in open channels

- 2.3.1. Chezy's formula
- 2.3.2. Kutter's formula
- 2.3.3. Bazin's formula
- 2.3.4. Manning's formula

2.4 Factors affecting roughness co-efficient

2.5 Values of roughness co-efficient for different channel conditions

2.6 Most economical section of channel -

- 2.6.1 Rectangular section
- 2.6.2 Triangular section
- 2.6.3 Trapezoidal section
- 2.6.4 Circular section

2.7 Specific energy of flow in a channel at a cross section

2.8 Explanation of the terms -

- 2.8.1 Critical depth
- 2.8.2 Critical flow
- 2.8.3 Sub-critical flow
- 2.8.4 Super-critical flow
- 2.8.5 Hydraulic jump

2.9 Measurement of flow in open channel by -

- 2.9.1 Surface slope measurement
- 2.9.2 Velocity measurement
- 2.9.3 Flow measurement

3. Turbines :

3.1 Introduction

3.2 Classification of turbines

3.3 Working principles of impulse and reaction turbine

3.4 Constructional detail and working of different types of turbines (No mathematical analysis.)

- 3.4.1 Pelton wheel turbine
- 3.4.2 Francis turbine
- 3.4.3 Kaplan turbine

4. Pumps :

4.1 Classification of pumps

4.2 Constructional detail of reciprocating pump

4.3 Constructional detail of centrifugal pump

4.4 Comparison of reciprocating and centrifugal pump

4.5 Brief description of submersible pump and deep well turbine pump

4.6 Installation and maintenance of pumps

DCE-403 SURVEYING-II

1. Levelling :

Definitions

1.1 Level surface

1.2 Level line

1.3 Horizontal line

1.4 Vertical line

1.5 Mean sea level

1.6 Reduced level

1.7 Names and function of different parts of -

- 1.2.1 Dumpy level
- 1.2.2 Tilting level
- 1.2.3 Auto level

1.8 Difference in dumpy and tilting level.

1.9 Internal and external focusing telescope

1.10 Temporary adjustments of dumpy and tilting level

1.11 Levelling staff

- 1.11.1 Self reading

- 1.11.2 Telescope staff

1.11.3 Target staff

1.12 Reading a levelling staff

1.13Levelling with dumpy and tilting levels

1.13.1 Taking observations

1.13.2 Recording in a level book.

1.14 Calculation of R.L.

1.14.1 Height of instrument method

4.14.2 Rise and fall method

4.14.3 Arithmetical checks

1.15 Types of levelling

15.1.1 Fly levelling

15.1.2 Differential levelling

15.1.3 Profile levelling

15.1.4 Reciprocal levelling

15.1.5 Precise levelling

15.2 Effect of curvature and refraction in levelling and their corrections.

1.16.3 Permanent adjustment

1.16.1 Dumpy level

1.16.2 Tilting level

2. Contouring :

2.1 Concept

2.2 Purpose of contouring

2.3 Contour interval

2.4 Horizontal equivalent

2.5 Factors affecting contour interval

2.6 Characteristics of contours

2.7 Methods of contouring - direct and indirect

2.8 Interpolation of contours

2.9 Uses of contour maps

2.10 Drawing cross sections from contour maps.

3. Plane Table Surveying :

3.1 Description and uses of plane table and its accessories

3.2 Advantages of plane table surveying

3.3 Centering, levelling and orientation of plane table

3.4 Radiation

3.5 Intersections

3.6 Traversing

3.7 Resection

3.8 Two point problems

3.9 Three point problems

3.10 Errors in plane tabling

3.11.Modern instruments

3.12 Automatic level

4 Theodolite :

4.1 Types

4.2 Different parts of a Vernier Transit Theodolite

4.3 Fundamental axes

4.4 Temporary adjustment

4.5 Transiting

4.6 Swinging

4.7 Measurement of horizontal angle (Repetition and Reiteration method)

4.8 Measurement of vertical angle

4.9 Measurement of the bearing

4.10 Prolonging a line

4.11 Use as level

4.12 Permanent adjustment

5. Trigonometrical Levelling :

5.1 Determination of heights and distance of a point

5.1.1 Base accessible

5.1.2 Base inaccessible

6. Curves :

6.1 Elements of simple circular curves

6.2 Designation of curve

6.3 Radius and degree of curve

6.4 Relation between radius and degree of curve

6.5 Setting out of simple circular curve by linear and tangential methods

6.6 Vertical curves

6.6.1 Types

6.6.2 Setting out of vertical curves

6.7 Transition Curves

6.7.1 Ideal transition curve

6.7.2 Types of transition curve

DCE-404 TRANSPORTATION ENGINEERING-II

1. Railways :

1.1 Railways, its importance

1.2 Railway systems in India

1.3 Gauge, different gauges in India

1.4 Advantages and disadvantages of more than one gauge

1.5 Definition of a permanent way

2. Rails :

2.1 Function of rails

2.2 Requirement of rails

2.3 Types of rail sections - Double headed rails, bull headed, flat footed rail

2.4 Standard length and weight of flat-footed rails for different gauges

2.5 Wear of rails- its causes and effects

2.6 Failures of rails

2.7 Creep-its definition, causes, effect and prevention

2.8 Corrugated or roaring rails.

2.9 Conning of wheels

3. Sleepers :

3.1 Functions of sleepers

3.2 Characteristics of good sleeper

3.3 Different types of rail sleepers- wooden, steel, cast iron, concrete and prestressed concrete

3.4 Size and shapes of all type of sleepers

3.5 Sleeper density

4. Ballast :

4.1 Functions of ballast

4.2 Characteristics of good ballast

4.3 Materials used as ballast - broken stone, gravel, cinder, kanker, moorum, brickbats etc.

4.4 Size and section of ballast

4.5 Quantity of ballast

4.6 Renewal of ballast

5. Fixture and Fastenings :

5.1 Connection of rail to fish plate and welded rails

5.2 Connection of rail to sleepers

5.3 Details of fixtures used

6. Railway Geometries :

6.1 Alignment of railway line

6.2 Typical cross sectioning singles and doubles tracks in cutting and embankment

6.3 Gradients, curve, transition length as per railway code

6.4 Super elevation, cant deficiency

6.5 Widening of gauge on curves

7. Points and Crossing :

7.1 Necessity and details of arrangement

7.2 Sketch of a turnout

7.3 Functions of different parts and components

7.4 Different types of point and crossing

7.5 Turnout, crossover, scissors, diamond crossing with slips, double junctions, gathering lines

7.6 Turn tables and triangles

.

8. Tracks Laying :

8.1 Plate laying

8.2 Methods of plate laying

8.3 Duties of a permanent way inspector

9. Maintenance :

9.1 Routine maintenance of formation and side slope

9.2 Routine maintenance of ballast, fixtures and drainage

9.3 Special maintenance - replacement of defective sleeper and rails

9.4 Tools used for the maintenance of track

.

10. Stations and Yards :

10.1 Classification

10.2 Requirement and layout of station and yards

10.3 Flag station, wayside station, junction, terminal station

10.4 Passenger yards, goods yards

10.5 Marshalling yards, locomotive yards

10.6 Station equipments

11. Signaling :

11.1 Classification and functions of signal

11.2 Types of signal - Semaphore, warner, shunt disc, colour light signal, outer, home, routing signal, starter, advanced starter, calling on and co-acting signals

11.3 3-aspect signals

11.4 Absolute block system

11.5 Automatic block system

11.6 Pilot guard system

12. Tunneling :

12.1 Introduction

12.2 Advantages and disadvantages

12.3 Methods of construction of tunnels full-face method and needle beam method

12.4 Factors effecting the alignment of tunnels

12.5 Description and sketches of different types of tunnels

12.6 Necessity of ventilation

12.7 Method of ventilation

12.8 Drainage of tunnels

12.9 Safety precautions to be taken at the time of construction of tunnels.

DCE-405 CONCRETE TECHNOLOGY

1. Cement :

1.1 Manufacture of Portland cement

1.2 Chemical composition

1.3 Hydration of cement

1.4 Types of cement

1.4.1 Ordinary Portland cement

1.4.2 Rapid hardening cement

1.4.3 Extra rapid hardening cement

1.4.4 Sulphate resisting cement

1.4.5 Blast furnace cement

1.4.6 Quick setting cement

1.4.7 Super sulphate cement

1.4.8 Low heat cement

1.4.9 Portland pozzolana cement

1.4.10 White cement

1.4.11Hydrophobic cement

1.4.12 Oil-well cement

1.4.4 High alumina cement

1.5 Testing of cement

1.5.1 Field testing

1.5.2 Fineness test

1.5.3 Specific gravity of cement

1.5.4 Standard consistency test

1.5.5 Setting time test

1.5.6 Strength test

1.5.7 Soundness test

2. Aggregates :

2.1 Classification of aggregates according to sources

2.2 Shape, size and texture

2.3 Bulk density

2.4 Specific gravity

2.5 Water absorption and moisture content

2.6 Bulking of aggregate

2.7 Alkali - aggregate reaction

2.8 Grading of aggregates

2.9 Sieve analysis

2.10 Standard grading curve

2.11 Specified grading

2.12 Gap grading

2.13 Flakiness index

2.14 Elongation index

2.15 Fineness modulus

2.16 Crushing value

2.17 Ten percent Fines value

3. Water :

3.1 Indian Standards for quality of water for use in cement concrete.

3.2 Effect of impurities in water on concrete.

4. Admixtures and Construction Chemical :

4.1 General

4.2 Admixtures

- 4.2.1 Plasticizers
- 4.2.2 Super plasticizers
- 4.2.3 Retarders
- 4.2.4 Accelerators
- 4.2.5 Air entraining admixtures
- 4.2.6 Pozzolanic or mineral admixtures
- 4.2.7 Air detraining admixtures
- 4.2.8 Alkali aggregate expansion inhibitors
- 4.2.9 Workability admixtures
- 4.2.10 Grouting admixtures
- 4.2.11Bonding admixtures

4.3 Construction chemicals

- 4.3.1 Concrete curing compounds
- 4.3.2 Polymer bonding agents
- 4.3.3 Floor hardener and dust proofers
- 4.3.4 Surface retarders
- 4.3.5 Bond aid for plastering
- 4.3.6 Ready to use plaster
- 4.3.7 Guiniting agents
- 4.3.8 Water proofing

5. Fresh Concrete :

5.1 Workability

5.2 Factors affecting workability

5.3 Measurement of workability

- 5.3.1 Slump test
- 5.3.2 Compacting factor test
- 5.3.3 Vee-Bee consistometer test

5.4 Segregation

5.5 Bleeding

5.6 Process of manufacture of concrete

6. Concrete Operation :

6.1 Batching

- 6.1.1 Volume batching
- 6.1.2 Weight batching

6.2 Mixing

- 6.2.1 Hand mixing
- 6.2.2 Machine mixing

6.3 Transporting of concrete

- 6.3.1 Mortar pan
- 6.3.2 Wheel barrow
- 6.3.3 Bucket and rope way
- 6.3.4 Truck mixer and dumpers
- 6.3.5 Belt conveyors
- 6.3.6 Chute
- 6.3.7 Skip and hoist
- 6.3.8 Pumps and pipeline

6.4 Placing concrete

6.5 Compaction of concrete

- 6.5.1 Hand compaction
- 6.5.2 Compaction by vibrators

Civil Engineering

6.6 Types of vibrators and its uses

6.7 Curing of concrete

- 6.7.1 Water curing
- 6.7.2 Membrane curing
- 6.7.3 Steam curing

6.8 Finishing

- 6.8.1 Formwork finishes
- 6.8.2 Requirements of good finish

6.9 Joints in concrete

- 6.9.1 Construction joints
- 6.9.2 Expansion joints
- 6.9.3 Contraction joints
- 6.9.4 Isolation joints

7. Strength of Concrete :

7.1 Water cement ratio

7.2 Gain of strength with age

7.3 Relation between compressive and tensile strength

7.4 Bond strength

7.5 Aggregate cement bond strength

8. Special Concrete :

8.1 Light weight concrete

8.2 No fines concrete

8.3 Aerated concrete

8.4 High density concrete

8.5 Fiber reinforced concrete

8.6 Polymer concrete

8.7 Gunite or shot concrete

8.8 RMC (ready mixed concrete)

8.9Ferro cement

8.10 High Performance concrete

9. Formwork :

9.1 Requirements of formwork

9.2 Types of formwork

9.3 Time for stripping formwork

10. Quality Control at Site :

10.1 Factors causing variations in the quality of concrete

10.2 Field control

10.3 Stastical quality control

10.4 Frequency of test

DCE-406 BUILDING TECHNOLOGY- I

1. Introduction :

1.1 Definition of a building

1.2 Classification of building based on occupancy

1.3 Explanation of different parts of a building

1.4 criteria for location and site selection, site plan and its detail

1.5Orientation:Meaning, factors affecting orientation

2. Foundation :

2.1 Concept of foundation

2.2 Factors affecting selection of foundations

2.3 Definition and importance of bearing capacity, Average bearing capacity of common soils.

2.4 Types of foundations- shallow and deep foundations

2.5 Shallow foundation- spread footings, raft and inverted arch foundation. Rankine's formula for depth offoundations

2.6 Deep Foundation - Pile foundation, their suitability, Classification of piles according to function, materialand installation

2.7 Causes of failure of foundation and remedial measures.

3. Walls :

3.1 Purpose of walls

3.2 Types of walls- Load bearing, non-load bearing

3.3 Partition walls - construction details, suitability and use of brick and wooden partition walls.

3.4 Cavity walls - Brief description and constructional detail of cavity walls

4. Brick Masonry :

4.1 Definition related to brick masonry

4.2 Bond, necessity of bond

4.3 Types of bonds- English, Flemish, header and stretcher, T-junction, corner junction.

4.4 Sketches for 1, 1½ and 2-brick thick wall and square pillars

4.5 Construction of brick walls-method of laying brick in walls and precautions to be taken for it.

5. Stone Masonry :

5.1 Definition related to stone masonry

5.2 Dressing of stones - Hammer dressing, chisel dressing

5.3 General principles for construction of stone masonry

5.4 Brief description and sketches of different types of stone masonry- Ashlar, random rubble and coursed

rubble. Ashlar facing to coursed, rubble and brick masonry.

5.5 Brief description, sketches and uses of joggles, dowels and cramps in stone masonry.

6. Scaffolding, Shoring and Underpinning:

6.1 Brief description and application of different types of scaffolding and shores.

6.2 Meaning and need for underpinning.

7. Dampness and its Prevention:

7.1 Causes of dampness in buildings and principles of its prevention.

7.2 Materials commonly used for damp proofing.

7.3 Damp proof course

7.4 Anti termite treatment of buildings before and after construction

6. Building Bye Laws :

6.1 Study of building bye laws as per IS 356-1067

6.2 Terminology related to residential building, building permit occupancy certificate, unsafe buildings,

enforcement code, offences and penalties.

6.3 Health sanitation and other requirements, means of access, open space requirements, plinth area,

projections, covered area in residential plots.

6.4 Distance from electric lines, plinth regulation, height regulation, size of rooms, lighting and ventilation,

construction of water closets, kitchen, mezzanine floor, stair cases, drainage and sanitation

1. Site Selection :

1.1 Selection of site for a building and building complex

1.2 Comparative study of sites with respect to local topography, flooding, soil access, location

1.3 Communication links, with surroundings availability of water and electricity, prevailing wind, made upground, water table, trees etc.

PRACTICAL AND SESSIONALS

DCE-407 ENGINEERING MECHANICS LAB

1. Determination of deflection for various types of loading
2. Torsion test on mild steel
3. Determination of stiffness of close coiled spring
4. Determination of stiffness of leaf spring
5. Compression test on common structural materials viz. timber, cast iron etc.

DCE-408 HYDRAULICS MACHINE LAB

1. Determination of coefficient of friction in pipe

2. Determination of losses of head in flow through pipes

3. Determination of roughness coefficient for different types of channel surfaces.

4. Determination of surface velocity and mean velocity in an open channel

5. Study of constructional features of working of Pelton wheel turbine and Francis turbine.

6. Study of constructional features and working of centrifugal and reciprocating pump

DCE-409 SURVEYING Lab II

1. Study of the component parts and handling of
   1.1. Dumpy level
   1.2. Tilting level
   1.3. Staves

2. Temporary adjustments of a dumpy level and a tilting level
3. Use of dumpy level and tilting level in differential levelling and levelling for cross section and longitudinal section.
4. Recording in level book and plotting.
5. Study of Automatic level.
6. Study and use of plane table and its accessories e.g. stand, table, clampingarrangement, sight vane, through compass, plumbing fork, plumb bob, sprit level etc.
7. .Methods of plane tabling
   7.1. Radiation
   7.2. Intersection
   7.3. Traversing
   7.4. Resection
8. Two and three point problems
9. Preparation of a plan on area by plane table survey.

10. Plotting spot levels of a given area by the grid method and interpolation of contours.
11. Preparations of a contoured plan of an uneven area with the help a level and a plane table.

12. 1. Study of parts of theodolite.
    2. Measurement of horizontal angles by repetition and reiteration method.
    3. Measurement of vertical angles.
    4. Measurement of bearing of line
    5. Prolonging of a line with theodolite.
    6. Running a closed traverse using theodolite, computations, balancing and plotting by Gale's traverse table
    7. Determination of stadia constants.
    8. Contouring by Tacheometry of a small area
    9 Setting out of simple circular curves.
    10. Determination of height of a distant point by trignometrical leveling

DCE-410 CONCRETE LAB

1. Determination of specific gravity of cement.
2. Determination of consistency of cement
3. Determination of Initial and Final setting time of cement.
4. Determination of fineness of cement
5. Determination of soundness of cement
6. Determination of compressive strength of cement
7. Determination of specific gravity and water absorption of aggregates
8. Determination of flakiness index and elongation index of aggregates

9 Determination of Bulk density of aggregate1.
10 Determination of fineness modules and grain size distribution
11 Determination of bulking of fine aggregate
12Test for workability
    12.1 Slump test
    12.2 Compaction factor test
    12.3 Vee-Bee test
13. Determination of strength of cement concrete.

1.

SHRI JAGDISHPRASAD JHABARMAL TIBREWALA UNIVERSITY
श्री जगदीशप्रसाद झाबरमल टीबडेवाला विश्वविद्यालय

INSTITUTE OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING
Teaching & Scheme of Examination for Diploma (Civil Engineering)
EFFECTIVE FROM ACADEMIC SESSION 2013-2016

Year: III **Semester:V**

S. No.	Subject Code	Subject Name	Hrs./Week			Exam Hrs.	Maximum & Minimum Marks		
			L	T	P		Internal/ Min. Pass Marks	External/ Min. Pass Marks	Total/Min. Pass Marks
Theory									
1	DCE-501	Building Technology–II	3	1	-	3	30/12	70/28	100/40
2	DCE-502	Public Health Engineering- I	3	1	-	3	30/12	70/28	100/40
3	DCE-503	Irrigation Engineering- I	3	1	-	3	30/12	70/28	100/40
4	DCE-504	Theory Of Structures	3	1	-	3	30/12	70/28	100/40
5	DCE-505	Estimation & Costing -I	3	1	-	3	30/12	70/28	100/40
6	DCE-506	Construction Management & Equipment	3	1	-	3	30/12	70/28	100/40
Practical's									
7	DCE-507	Building Planning & Drawing Lab	-	-	3	3	40/16	60/24	100/40
8	DCE-508	Public Health Engineering Lab-I	-	-	3	3	40/16	60/24	100/40
9	DCE-509	Estimation & Costing Lab-I	-	-	3	3	40/16	60/24	100/40
10	DCE-510	Practical Training	-	-	3	3	40/16	60/24	100/40
		Total	**1-8**	**6**	**12**				**1000**
		Total Teaching Load	**36**						

DCE-501 BUILDING TECHOLOGY – II

1. Doors & Windows:

1.1 Types of door frames - stone, timber, steel, concrete

1.2 Description and sketches of different types of doors ledged, battened and braced door, framed and panelled door, glazed and panelled doors, louvered doors, flush doors.

1.3 Use of collapsible door, rolling steel doors, side sliding doors, wire mesh doors.

1.4 Names, uses and sketches of - fully panelled window, fully glazed windows

1.5 Casement and pivoted window, dormer window, clearstory window, skylight, fanlight and ventilators

1.6 Window frames of different materials- wood, steel, aluminium.

2. Stairs and Stair Cases :

2.1 Glossary of terms related to stairs

2.2 Brief description and sketches of common types of staircase : Straight flight, Quarter turn, Half turn dog legged and open newel, Bifurcated, Circular, Spiral

2.3 Classification of staircases according to materials used.

2.4 Rise, Tread & Going of the different type of stair.

3. Roofs :

3.1 Functions of roofs and ceilings. Brief description, constructional details and suitability of common types
of roofs.

3.2 Definition of terms for pitched roofs, principal rafter, common rafter, jack rafter, hip rafter, valley rafter,ridge piece, caves, purlins, cleats, wall plates, valley gutter, side gutter, gable, facia board.

3.3 Roof coverings for pitched roofs - Asbestos cement and C.G.I. method of arranging and fixing to battens,rafters, purlins both steel and wooden.

3.4 Drainage arrangement for pitched and flat roofs.

4. Floors :

4.1 Ground floors

4.2 Brief description, uses and construction of ground floors - Brick on edge; tiles, stone slab, marble and
glazed tiles, lime concrete, cement concrete, terrazzo and mosaic.

5. Finishing of buildings :

5.1 Different types of plastering, rendering and painting

5.2 Methods of plastering, and curing

5.3 Defects in plasters and repairs of the defects.

5.4 Different types of painting uses and methods of painting

6. Arches and Lintels :

6.6 Meaning and uses of arches and lintels

6.2 Glossary of terms related to arch and lintels

6.3 Thickness of lintels, Effective span

6.4 Type of arches e.g. semi circular, segmental arches, elliptical, pointed, relieving arch, flat arch.

6.5 Thickness of semi-circular and segmental arches by empirical rules

DCE-502 PUBLIC HEALTH ENGINEERING- I

1. Water Demand and Quantity :

1.1 Water demand per capita for domestic and other uses

1.2 Population forecast

1.3 Fire demand

1.4 Design period

1.5 Demands as per B.I.S

1.6 Sources of Water

1.7 Quality of water obtained from different sources

2. Quality of Water :

2.1 Examination of water

- 2.1.1 Physical
- 2.1.2 Chemical
- 2.1.3 Bacteriological

2.2 Potability of water

2.3 Impurities of water

- 2.3.1 Suspended
- 2.3.2 Colloidal
- 2.3.3 Dissolved impurities

2.4 Permissible standard for potable water

2.5 Effects of impurities if they are more than permissible limits

3. Treatment of Water :

3.1 Flow diagrams of treatment plants

3.2 Function, constructional details, working of

- 3.2.1 Aeration unit
- 3.2.2 Feeding and mixing devices of chemicals
- 3.2.3 Sedimentation
- 3.2.4 Coagulation and flocculation unit
- 3.2.5 Filtration unit
  - 3.2.5.1 Slow sand filter
  - 3.2.5.2 Rapid sand filter
  - 3.2.5.3 Pressure filter

3.3 Chlorination

3.4 Chemicals used in treatment

3.5 Desalination and defluoridation

4. Regulatory Valves :

4.1 Sluice valve (gate valve)

4.2 Reflux valve

4.3 Air release valve

4.4 Scour valve

4.5 Safety valves

4.6 Pressure relief valves

4.7 Fire hydrants

5. Distribution of Water :

5.1 Systems of supply

- 5.1.1 Intermittent
- 5.1.2 Continuous

5.2 Service reservoirs

5.3 Advantages and disadvantages of metered water supply

5.4 Types of layouts

- 5.4.1 Dead end system and its design as per PHED practice
- 5.4.2 Grid system
- 5.4.3 Radial system

6. Rural Water Supply :

6.1 Important aspects

6.2 Sources

6.3 Treatment

DCE-503 IRRIGATION ENGINEERING- I

1.1 History of irrigation development in India.

1.2 Classification and different methods of irrigation.

2. Water Requirements of Crops :

2.1 Classes and availability of soil water

2.2 Depth and frequency of irrigation

2.3 Relationship between duty, delta and base period.

2.4 Gross command area (G.C.A.) culturable commanded area (C.C.A.), culturable cultivated and uncultivated area. Intensity of irrigation

2.5 Factors affecting duty of water, methods of improving duty

2.6 Principal crops of rajasthan and India. Sowing and harvesting time

2.7 Water requirements and rotation of different crops

2.1 Calculation of water requirement for a given irrigated area

.

3. Hydrology:

3.1 Hydrologic cycle

3.2 Rainfall its characteristics and methods of measurement.

3.3 Run off, factors affecting run off, determination of average annual run off.

3.4 Importance and different methods of gauging stream flow. Hydrograph, unit hydrograph and flood

Hydrograph

4. Dams :

4.1 Types of Dams

4.2 Selection of site for a dam

4.3 Forces acting on a gravity dam

4.4 Failure of gravity dams

5. Earthen and Rock fill Dams :

5.1 Homogeneous dams and composite dams

5.2 Causes of failure of earthen dams

5.3 Drainage of earthen dam

5.4 Rock-fill dams : basic features and its need

6. Spillways :

6.1 Brief description and functions of different types of spillways

7.River Training Works :

7.1 River behaviour in plane and mountainous regions

7.2 Different methods of river training works sketches and brief description

DCE-504 THEORY OF STRUCTURES

1.Indeterminate Structures :

1.1 Types of indeterminacy

1.2 External and internal

1.3 Degree of indeterminacy in beams and pin jointed frames

2. Slope and Deflection:

2.1 Calculation of slope and deflection in simply supported and cantilever beams, loaded with point and uniformly distributed load by

- 2.1.1 Double integration method
- 2.1.2 Macaulay's method
- 2.1.3 Area moment method

3. Propped Cantilever Beam:

3.1 Concept

3.2 Drawing of B.M.D. and S.F.D. for propped cantilever beams loaded with point loads and U.D.L.

3.3 Slope and deflection for point loads and U.D.L

.

4. Fixed Beams:

4.1 Concept

4.2 Drawing of BMD and SFD using Mohr's theorem

5. Continuous Beams:

5.1 Drawing of BMD and SFD for continuous beams loaded with point load and UDL using Claypeyron's

Theorem of three moments

6. Rolling Loads :

6.1 Drawing of maximum B.M.D. and S.F.D. for simply supported beam for rolling loads of

- 6.1.1 Single concentrated load
- 6.1.2 Two point loads
- 6.1.3 Series of point loads
- 6.1.4 U.D.L. longer than span
- 6.1.5 U.D.L. shorter than span

7. Influence Line Diagram for the following in Simply Supported Beams :

7.1 Reaction

7.2 Shear force

7.3 Bending moment

DCE-505 ESTIMATION & COSTING –I

1. Introduction :

1.1 Purpose

1.2 Importance of estimating

1.3 Common items of works in civil engineering construction works

1.4 Units of measurement for common items of works

1.5 Methods of measurement

1.6 Explanation of common terms used for estimating

1.7 Different types of estimates and their significance

1.8 Merits and demerits.

1.9 Methods of taking out quantities

1.10 Study of Basic Schedule of Rates (B.S.R.)

2. Rate-Analysis:

2.1 Factors affecting cost of work

2.2 Explanation of terms

2.3 Prime cost

2.4 Original cost

2.5 Provisional items

2.6 Provisional sum

2.7 Day work, item wise

2.1 Analysis of cost of material

2.1Labour

2.1 Transport

2.2 Establishment charges and incidentals

2.3 Preparation of analysis of rates for items of work involved in building construction

3. Specifications:

3.1 Importance of specifications. Principles for writing out specifications, types of specification

3.2 Writing general and detailed specifications for items of work in building

4. Detailed Estimates for Buildings:

4.1 Calculation of quantities

4.2 Preparing abstract of cost for a residential building.

5. Earth Work Calculations for Road & Rail Formation :

5.1 Earthwork calculations and estimates for roads and rail formation

For earth work following methods may be used :

5.1.1 Mean depth method.

5.1.2 Mean area method.

5.1.3 Prismoidal formula method

5.1.4 Graphical method

Using longitudinal and typical cross sections

5.2 Cross section for different stations.

5.3 Finding earth work by these sections

5.4 Calculation of permanent and temporary lands for roads

5.5 Economical depth of digging for canals

5.6 Mass haul diagram

DCE-506 CONSTRUCTION MANAGEMENT & EQUIPMENT

1. Introduction:

1.1 Different types of construction

1.2 Stages in construction from conception to realization

1.3 Construction team - owners, engineer and contractor

1.4 Construction management

1.4.1 Necessity

1.4.2 Resources - men power, machines, materials, money and management

1.4.3 Function of construction management-planning, organizing, staffing, directing, controlling and coordinating

1.4.4 Joint venturing and BOT (Build Operate and Transfer) projects

2. Construction Planning:

2.1 Construction project planning

2.2 Stages in planning

2.3 Bar charts

2.4 Introduction to Network

2.5 Planning and scheduling by bar charts

2.6 Limitations of bar chart

2.7 PERT and CPM

2.8 Network construction

2.9 Determination of project schedule and critical path of a network for different cases

2.1 Resource allocation and cost time balancing.

3. Organisation :

3.1 Types of organisation

3.1.1 Line, functional and line & staff and their description chart

3.1.2 Advantages, disadvantages and applications of various organisation

3.1.3 Principles of organisation

3.1.4 Site organisation

3.1.5 Principles of storing and stacking materials at site

3.1.6 Location of equipments

3.1.7 Introduction of job layout and factors influencing it

4. Construction Contracts :

4.1 Introduction

4.2 Proposal and agreements

4.3 Types of construction contracts :lumpsum contract, rate contract, cost plus contracts, turnkey contracts

4.4 General conditions of contracts

4.5 Contract labour act.

5. Construction Labour :

5.1 Condition of construction workers in India

5.2 Wages paid to workers

5.3 Trade unions

5.4 Trade union act

5.5 Important provisions of Minimum Wages Act

5.6 Productivity in construction

5.7 Workman's Compensations Act

6. Inspection and Quality Control :

6.1 Technical services required for inspection

6.2 Quality construction

6.3 Quality control operation

6.4 Quality control in concreting, earthwork and other constructions.

6.5 Methods of recording progress of a project

7. Construction Safety :

7.1 Meaning and scope

7.2 Legal requirements

7.3 Causes and effects of accidents

7.4 First Aid

7.5 First prevention

7.6 Safety programme

7.7 Safety training

PRACTICAL AND SESSIONALS

DCE-507 BUILDING PLANNING& DRAWING LAB

1. Sketch of
    - 1.1.1. Panelled door
    - 1.1.2. Panelled& glazed door
    - 1.1.3. Laced battened and braced door
2. Window
    - 2.1.1. Panelled window
    - 2.1.2. Section window
    - 2.1.3. Panelled& glazed window
    - 2.1.4. Glazed window
3. Drawing of staircase
    - 3.1.1. Dog legged
    - 3.1.2. Open newel
4. Sketch of a roof truss showing the details

5. Detail section, working plan, elevation of the following
    - 5.1.1. Two bedroom residential building (single story)
    - 5.1.2. Three bed room duplex bungalow
    - 5.1.3. Detail plan of above house showing house drainage, water supply and electrical fitting
    - 5.1.4. Hostel building
    - 5.1.5. Dispensary
    - 5.1.6. Primary school

DCE-508 PUBLIC HEALTH ENGINEERING Lab -I

1. To determine residual chlorine by Orthotolidine-Sodium test.
2. To determine optimum dose of coagulant by jar test.
3. To determine hardness of water by E.D.T.A. test.
4. To determine pH value of water by universal indicator method.
5. To determine total, dissolved and suspended solids in a water.
6. To determine turbidity of water by Jackson Turbidimeter or nephelometer.
7. To determine the alkalinity by titration method.
1. sketch of sluice,reflux,airrelease,scour,safteyvalue

DCE-509 ESTIMATION &COSTING Lab–I

1.Writing units for various items of work involved in construction
2. Recording measurement in M.B.
3. Finding out the quantities of work for a residential building.
4. Calculation of arch masonry.
5. Preparation of detailed estimate for a residential building.
    5.1 Single storey
    5.2 Double storey
6. Writing detailed specifications and rate analysis schedules for
    6.1 Earth work in excavation.
    6.2 Concrete in foundation.
    6.3 Brick work in sub and super structure.
    6.4 Random rubble and Ashler masonry.
    6.5 RCC in beams and slabs.
    6.6 Plastering
    6.7 Pointing
    6.8 White washing, colour washing and distempering
7. Calculation of earthwork by average depth, average area, prismoidal formula and graphical method.
8 Find out earthwork for roads using longitudinal section and typical cross section.
9 Calculation of permanent and temporary land for roads.
10. Finding earth work for irrigation canals using L-section and cross section.
11. Calculation of permanent and temporary land for canals
12. Detailed estimate for septic tank and soak pit
13. Valuation by different methods.
14. Typical valuation reports
15. Calculation of rent of residential building
16. Calculation of rent of commercial building
1. Sketching of common hand tool used in building construction
    2. Sketching of foundation
        2.1. Spread footing for internal and external wall
        2.2. Raft foundation
        2.3. Inverted archfoundation
        2.4. Different type of piles
    3. Sketch of walls
        3.1. Cavity wall
        3.2. English wall and Flemish bond for one &half wall,two wall corner
        3.3. Different type of stone masanory

    Sketch of different type of scaffolding

DCE-510 PRACTICAL TRANING

SHRI JAGDISHPRASAD JHABARMAL TIBREWALA UNIVERSITY
श्री जगदीशप्रसाद झाबरमल टीबडेवाला विश्वविद्यालय

INSTITUTE OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING
Teaching & Scheme of Examination for Diploma (Civil Engineering)
EFFECTIVE FROM ACADEMIC SESSION 2013-2016

Year: III **Semester: VI**

S. No.	Subject Code	Subject Name	Hrs./Week			Exam Hrs.	Maximum & Minimum Marks		
			L	T	P		Internal/ Min. Pass Marks	External/ Min. Pass Marks	Total/Min. Pass Marks
Theory									
1	DCE-601	Public Health Engineering- II	3	1	-	3	30/12	70/28	100/40
2	DCE-602	Irrigation Engineering- II	3	1	-	3	30/12	70/28	100/40
3	DCE-603	Design Of Steel Structure	3	1	-	3	30/12	70/28	100/40
4	DCE-604	Design Of R.C.C Structure	3	1	-	3	30/12	70/28	100/40
5	DCE-605	Estimation & Costing –II	3	1	-	3	30/12	70/28	100/40
6	DCE-606	Environment Engineering	3	1	-	3	30/12	70/28	100/40
Practical's									
7	DCE-607	Public Health Engineering-Lab II	-	-	3	3	40/16	60/24	100/40
8	DCE-608	Estimation & Costing Lab–II	-	-	3	3	40/16	60/24	100/40
9	DCE-609	Computer Aided Drawing Lab	-	-	3	3	40/16	60/24	100/40
10	DCE-610	Project	-	-	3	3	40/16	60/24	100/40
		Total	**18**	**6**	**12**				**1000**
		Total Teaching Load	**36**						

DCE-601 PUBLIC HEALTH ENGINEERING- II

1. Quantity of Sewage:

1.1 Domestic sewage, 1.2 Industrial wastes

1.3 Storm water

1.4 Volume of domestic sewage dry weather flow (D.W.F.) and equivalent DWF, 1.5 Variation of flow

1.6 Limiting velocities, 1.6.1 Non-silting velocity

1.6.2 Non-scouring velocity, 1.6.3 Self cleansing velocity, 1.6.4 Transporting velocity

1.7 Depth of flow

2. Characteristics and Composition of Sewage :

2.1 Decomposition of sewage, 2.2 Sewage sampling

2.3 Physical and chemical analysis

2.4 Testing of sewage, 2.4.1 Physical test

2.4.2 Biological test, 2.4.3 Chemical test

3. Building Drainage:

3.1 Aims and requirements

3.2 Fittings and arrangements in single and multi storied buildings

3.3 Different sanitary fitting and their installation

3.4 Traps, seal in traps, 3.5 Gulley trap

3.6 Intercepting trap, 3.7 Grease trap

3.8 Causes of breaking seal in the traps and precautions, 3.9 Testing of house drainage system

3.10 Septic tank, 3.11 Soak pit

4. Sewerage Systems:

4.1 Types, 4.1.1 Separate system

4.1.2 Combined system, 4.1.3 partially separate system, 4.2 Stone ware sewers, 4.3 Cast iron sewers

4.4 Concrete sewers, 4.5 Sewer Joints

4.6 Different shapes of sewers

5. Appurtenances:

5.1 Manholes, 5.1.1 Location

5.1.2 Location, 5.1.3 Construction

5.2 Drop manhole, 5.3 Inlets, 5.4 Catch basin

5.5 Inverted siphon, 5.6 Flushing tanks

5.7 Ventilating shaft, 5.8 Lamp holes

6. Laying of Sewers:

6.1 Setting out alignment

6.2 Excavation

6.3 Checking the gradient using boning rod

6.4 Preparation of bed

6.5 Lowering, laying and jointing

6.6 Testing

6.7 Back filling

6.8 Construction of masonry sewers

6.9 Construction of surface drains

7. Maintenance:

7.1 Inspection of mains

7.2 Cleaning of sewers

7.3 Precautions during cleaning operations

7.4 Maintenance of traps

7.5 Cleaning of house drainage line

7.6 Ventilation of sewers

7.7 Tools and equipment needed for maintenance

8. Sewage Disposal:

8.1 General composition of sewage

8.2 Strength of sewage

8.3 Land disposal

8.4 Dilution method of disposal

8.5 Nuisance due to disposal

8.6 Self-purification of streams

9. Treatment and Disposal:

9.1 Primary treatment

9.2 Secondary treatment

9.3 Function and construction of

9.3.1 Screening chambers, 9.3.2 Grit chambers

9.3.3 Clarifier chambers, 9.3.4 Trickling filters

9.3.5 Aeration tank, 9.3.6 Activated sludge process

9.4 Sludge treatment, 9.5 Sludge digestions

9.6 Sludge disposal

10. Rural Sanitation:

10.1 Introduction

10.2 Dry and wet latrines : selection, location, design life

10.3 Latrine for waterlogged high flood areas.

10.4 Aqua privies

10.5 Storm water and sludge problem

DCE-602 IRRIGATION ENGINEERING- II

1. Canals :

1.1 Explanation of terms-canal

1.2 Classification of canals, channel, major distributory, minor distributory, water course, navigation canal, hydro-canal, irrigation canal, perennial canal, inundation canal

1.3 Water shed

1.4 Drainage

1.5 Alignment of irrigation canal

1.6 Explanation of terms-critical velocity, rugosity coefficient, velocity ratio, silt factor

1.7 Regime, regime slope, regime dimensions

1.8 Relation between Kennedy's critical velocity ratio and Lacey's silt factor.

1.9 Problems of sediment transport in channels.

1.10 Salient features of Kennedy's and Lacey's silt theories

1.11 Computing the losses in irrigation channels

2. Cross Drainage Works :

2.1 Brief description of different methods of disposal of drainage intercepted by canals

2.2 Inlet and outlet

2.3 Aqueduct and syphon aqueduct

2.4 Super passage and syphon

2.5 Level crossing

3. DistributoryWorks :

3.1 Brief description and sketches of

- 3.1.1 Distributory head
- 3.1.2 Silt selective device
- 3.1.3 Discharge regulator
- 3.1.4 Tail escape
- 3.1.5 Bed bar tail escape

4. Well Irrigation :

4.1 Explanation of terms - well, open well tube well, shallow and deep well, ground water reservoir, mota layer, depression head, cone of depression, radius of influence critical velocity.

4.2 Classification of tube well

- 4.2.1 Slotted wells
- 4.2.2 Strainer wells
- 4.2.3 Cavity wells

4.3 Brief description and sketches of common types of strainer

4.4 Construction of strainer well - selection of site boring and lowering of casing tube, preparation of strata

chart, lowering strainers, shrouding, development

4.5 Construction of slotted and cavity wells

4.6 Duty of open wells and tube wells

4.7 Relative advantages and disadvantages of open wells and tube wells.

5. Water Logging :

5.1 Definition

5.2 Causes, effects and preventive measures

5.3 Types of canal lining brief description and advantages

6. Diversion Head Works :

6.1 Typical layout of head works

6.2 Brief description, sketches and function of component parts of weir or barrage

6.3 Scouring sluices, silt excluder

6.4 Divide-wall

6.5 Fish ladder

6.6 Guide bank

6.7 Marginal bunds

6.8 Head regulator

6.9 Classes of weirs

- 6.9.1 Rockfill weir
- 6.9.2 Bligh type weir
- 6.9.3 Khosla type weir
- 6.9.4 Pickup weir

6.10 Causes of failure of weirs

DCE-603 DESIGN OF STEEL STRUCTURE

1. Introduction :

1.1 Structural Steel

1.2 Structural Steel Sections

1.3 Steel as a structural material

- 1.3.1 Advantages
- 1.3.2 Disadvantages

1.4 Limit State Method

- 1.4.1 Introduction
- 1.4.2 Limit state design
- 1.4.3 Limit state of strength
- 1.4.4 Limit state of serviceability

1.5 Partial safety factor for material strength

1.6 Partial safety factor for loads.

2. Bolted Connections :

2.1 Types of Bolts

2.2 Definition and detailing of Bolts

2.3 Types of bolted joints

2.4 Failure of bolted joints in

2.5 Design strength of bolt

- 2.5.1 Bolts in shear
- 2.5.2 Bolts in Tension
- 2.5.3 Bolts in Bearing
- 2.5.4 Tension capacity of plate
- 2.5.5 Combined shear and tension

2.6 Efficiency of Bolted Joint

3. Welded Connections :

3.1 Advantages and Disadvantage of welded joint

3.2 Permissible stresses in welds

3.3 Types of welded connections

3.4 Design of butt and fillet welded connections subjected to axial loads

4. Design of Tension Members:

4.1 Net sectional area

4.2 Design strength due to yielding of gross section

4.3 Design strength due to rupture at net section

4.4 Design strength due to block shear

4.5 Design of tension members (flats, angles and tee sections only.)

5. Compression Members:

5.1 End conditions: Effective length, slenderness ratio, radius of gyration

5.2 Permissible stresses in compression as per IS :100-1107

5.3 Strength of columns-single and built up sections.

5.4 Design of angle struts.

5.5 Design of axially loaded

- 5.5.1 Single rolled steel section
- 5.5.2 Built up section

5.6 Design of lacing

5.7 Design of battens

6. Column Bases:

6.1 Design of slab base

6.2 Design of gusseted base

7. Design of Beams:

7.1 Plastic methods of design

- 7.1.1 Plastic section modulus
- 7.1.2 Shape factor
- 7.1.3 Plastic hinge

7.2 Methods of Plastic Analysis

7.3 Plastic analysis of structures

7.4 Shear behaviour of steel beam

7.5 Factors affecting plastic moment capacity.

7.6 Design of laterally restrained beams

7.7 Web buckling and crippling

8. Roof Trusses:

8.1 Basic components of roof truss.

8.2 Types of loads on roof truss-

- 8.2.1 Dead load
- 8.2.2 Live load
- 8.2.3 Wind load.

8.3 Design of purlins (only angle section for the given load)

8. Plate Girder:

8.1 Components of plate girder.

8.2 Loads on plate girder.

8.3 Sketches of bolted and welded plate girder with various types of stiffeners.

DCE-604 DESIGN OF R.C.C STRUCTURE

1. Introduction :

1.1 Reinforced Cement Concrete- its meaning, constituents, functions and specifications as per I.S..

1.2 Working stress method of design

1.3 Limit state method of design

1.4 Ultimate method of design

1.5 Past practice and present practice for the design of structures.

1.6 Grades of concrete and steel

1.7 Stress - strain curve for concrete and steel

1.1 Load factors

1.1 Steel concrete bond, development length, anchorage value

1.1 Effective span, specification of reinforcement as per BIS

2. Flexural Members :

2.1 Limit state of collapse

2.2 Limit state of flexure

2.3 Neutral axis, moment of resistance, balanced and unbalanced sections

2.4 Limit state of shear, nominal shear stress, shear strength of beam.

2.5 Design of shear reinforcement

2.6 Limit state of serviceability deflection and cracking criteria.

2.7 Curtailment of bars

3. Analysis and Design of Beams :

3.1 Single reinforced beam

3.2 Doubly reinforced beam

3.3 T-beam

3.4 Lintel

3.5 Cantilever beam

4. Slabs :

4.1 Design criteria as per BIS

4.2 Design of one-way slab

4.3 Design of two-way slab with corners free to lift

5. Compression Members (axially loaded columns)

5.1 Limit state of compression

5.2 Load carrying capacity

5.3 Design of short column (rectangular, square and circular cross section)

6. Design of Footing :

6.1 Critical section for shear and bending moment

6.2 Design of an isolated footing of uniform depth for a square column

6.3 Layout of reinforcement

7. Retaining Wall :

7.1 Types of retaining walls

7.2 Design of cantilever type retaining wall

7.3 Reinforcement details

8.1PrestressedConcrete :

8.1 Definition, advantages and methods of prestressing

8.2 Losses in prestressing

8.3 Stress calculations for point loads and uniformly distributed load for different tendon positions

DCE-605 ESTIMATION & COSTING –II

Preparing Detailed Estimates for the Various Items of Work from the given Drawing for

6.1 Detailed estimates for earthwork of irrigation canals

6.2 Septic tank and soak pit

6.3 Bitumen road

7. Valuation of Property and Rent Fixation :

7.1 Objects of valuation

7.2 Free-hold property

7.3 Lease-hold property

7.4 Property income

7.5 Obsolescence
7.6 Market-value
7.7 Book value
7.8 Distress value
7.9 Monopoly value
7.10 Salvage value
7.11 Scrap value
7.12 Accommodation value
7.13 Replacement value
7.14 Sentimental value
7.15Speculative value
7.16 Factors affecting the value of the property
7.17 Annuity
7.18 Capital cost
7.19 Capitalized value
7.20 Year's purchase
7.21 Methods of determining depreciation
7.22 Valuation of property
7.23 Method of determining valuation of property
7.24 Typical valuation report
7.25Types of rents
7.26 Rules of capital cost fixation for govt. buildings
7.27 Rules for calculation of standard rent

8. Procedure of Works :

8.1 Main staff structure of engineering department
8.2 Duties of junior engineer
8.3 Administrative approval
8.4 Expenditure sanction or approval
8.5 Technical sanction or a approval
8.6 Tender System
8.7 E-tendering
8.8 Technical bid and financial bid
8.9 Appropriation and re-appropriation of funds
8.10 Procedure for original minor and major works
8.11 Repair works
8.12 Types of estimates
8.13 Preliminary estimate
8.14 Cubical content estimate
8.15 Plinth area estimate
8.16 Revised estimate
8.17 Supplementary estimate
8.18 Daily labour on muster roll system
8.19Completion report

9. Stores, Tools and Plants :

9.1 Purchase of stores
9.2 Reserve of stock
9.3 Dead stock
9.4 Surplus and unserviceable stores
9.5 Verification of stores
9.6 Issue of materials from stock
9.7 Tools and plants
9.8 M.A.S. account

DCE-606 ENVIRONMENT ENGINEERING

1. Environment and Ecology :

1.1 Definition and understanding of their concept
1.2 Ecosystem
1.3 Energy flow in an ecosystem
1.4 Important bio chemical cycles (water, carbon, oxygen)
1.5 Communities relationship in an eco system

2. Factors Affecting Environmental Pollution :

2.1 Population
2.2 Urbanisation
2.3 Industrialisation
2.4 Transportation
2.5 Insecticide
2.6 Animals
2.7 Wars
2.1 Deforestation

3. Water Pollution :

3.1 Fresh water
3.1.1 Causes of water pollution in surface and ground water
3.1.2 Water quality standards
3.1.3 Remedial measures to control fresh water pollution
3.2 Waste water

3.2.1 Adverse effects of domestic and industrial effluents

3.2.2 Standards for industrial effluents

3.2.3 Remedial measures to control industrial pollution

4. Air Pollution :

4.1 Definition

4.2 Sources

4.3 Harmful effects on living and non living beings

4.4 Permissible limits as per Indian standard

4.5 Remedial measures

5. Noise Pollution :

5.1 Introduction

5.2 Sources of noise

5.3 Decibel scale

5.4 Adverse effect on human beings and environment

5.5 Control measures

6. Land Pollution :

6.1 Introduction

6.2 Sources of land pollution

6.3 Effects of land pollution

6.4 Control measures

6.5 Soil conservation

7. Environmental Impact Assessment (EIA) :

7.1 Introduction

7.2 E.I.A. of thermal power plants, mining and nuclear radiation

8. Global Environmental Issues :

8.1 Deforestation

8.2 Land sliding

8.3 Recharging and drying of water resources

8.4 Green house effects

8.5 Ozone depletion

8.6 Acid rain

8.7 Global warming

9. Non Conventional Sources of Energy in Environmental Protection.

9. Pollution Control Acts :

9.1 Water Pollution Control Act 1974 and 1981

9.2 Air Pollution Control Act 1981

9.3 Forest (Animal) Conservation Act 1972

9.4 Environmental Protection Act 1986

9.5 Pollution Control provisions in Motor Vehicle Act

2. Environment Laws :

2.1 Water Pollution Prevention and Control Act

2.2 Air Pollution Prevention and Control Act

PRACTICAL AND SESSIONALS

DCE-607 PUBLIC HEALTH ENGINEERING- II

Sampling procedure for water and sewage.

1. Determination of chlorides of sewage sample.

1. Determination of sulphates of sewage sample.

2. Determination of BOD of sewage sample.

3. Determination of COD of sewage sample.

4.Flow diagram of sewage treatment plant with sketch

5.Study of various types of traps

6.Study of various types of urinals water closets

7.Study of various types of sytem of sewage pipes and their joints

8.Study of various types of manholes, septictank, trickling filter

DCE-608 ESTIMATION & COSTING –II

1Calculation of earthwork by average depth, average area, prismoidal formula and graphical method.

2. Find out earthwork for roads using longitudinal section and typical cross section.

3. Calculation of permanent and temporary land for roads.

4. Finding earth work for irrigation canals using L-section and cross section.

5. Calculation of permanent and temporary land for canals

6. Valuation by different methods.

7. Typical valuation reports

8. Calculation of rent of residential building

9. Calculation of rent of commercial building

DCE-609COMPUTER AIDED DRAWING

Getting Started – I

Starting AutoCAD – AutoCAD screen components – Starting a drawing: Open drawings, Create drawings (Start from scratch, Use a template & Use a wizard) – Invoking commands in AutoCAD – Drawing lines in AutoCAD – Co-ordinate systems: Absolute co-ordinate system, Relative co-ordinate system – Direct distance method – Saving adrawing: Save & Save As – Closing a drawing – Quitting AutoCAD

2. Getting Started – II

Opening an existing file – Concept of Object – Object selection methods: Pick by box, Window selection, Crossing Selection, All, Fence, Last, Previous, Add, Remove – Erasing objects: OOPS command, UNDO / REDO commands – ZOOM command – PAN command, Panning in real time – Setting units – Object snap, running object snap mode – Drawing circles

3. Draw Commands

ARC command – RECTANG command – ELLIPSE command, elliptical arc – POLYGON command (regular polygon) – PLINE command – DONUT command – POINT command – Construction Line: XLINE command, RAY command – MULTILINE command

4. Editing Commands

MOVE command – COPY command – OFFSET command – ROTATE command – SCALE command – STRETCH command – LENGTHEN command – TRIM command – EXTEND command – BREAK command – CHAMFER command – FILLET command – ARRAY command – MIRROR command –MEASURE command – DIVIDE command – EXPLODE command – MATCHPROP command – Editing with grips: PEDIT

5. Drawing Aids

Layers – Layer Properties Manager dialog box – Object Properties: Object property toolbar, Properties Window – LTSCALE Factor – Auto Tracking – REDRAW command, REGEN command

6. Creating Text

Creating single line text – Drawing special characters – Creating multiline text – Editing text – Text style

7. Basic Dimensioning

Fundamental dimensioning terms: Dimension lines, dimension text, arrowheads, extension lines, leaders, centre marks and centrelines, alternate units – Associative dimensions – Dimensioning methods – Drawing leader

1. Inquiry Commands

AREA – DIST – ID – LIST – DBLIST – STATUS – DWGPROPS

1. Editing Dimensions

Editing dimensions by stretching – Editing dimensions by trimming & extending – Editing dimensions: DIMEDIT command – Editing dimension text: DIMTEDIT command – Updating dimensions – Editing dimensions using the properties window – Creating and restoring Dimension styles: DIMSTYLE

1. Hatching

BHATCH, HATCH commands – Boundary Hatch Options: Quick tab, Advance tab – Hatching around

Text, Traces, Attributes, Shapes and Solids – Editing Hatch Boundary – BOUNDARY command

2. Blocks

The concept of Blocks – Converting objects into a Block: BLOCK, _BLOCK commands – Nesting of Blocks – Inserting Blocks: INSERT, MINSERT commands – Creating drawing files: WBLOCK command – Defining Block Attributes – Inserting Blocks with Attributes – Editing Attributes

3. Plotting Drawings in AutoCAD

PLOT command – Plot Configuration – Pen Assignments – Paper Size & Orientation Area – Plot Rotation & Origin – Plotting Area – Scale

4. Draw working plan, elevation of the following.

4.1 Three bed room duplex bungalow with the given plot size

4.2 Detailed plan of above showing house drainage, water supply and electrical fittings as per BIS.

4.3 Hostel building

4.4 School building

DCE-610 PROJECT