Computer Application (CADD)

Subject Code

05302

Theory

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<th>No. of Periods per week</th>
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Rationale and Objective:

S.No. | Topics                                         | Periods |
------|-----------------------------------------------|---------|
01    | Introduction to drafting package.             | (04)    |
02    | Understanding CAD commands.                   | (08)    |
03    | Basic Drawing Techniques.                     | (12)    |
04    | Drawing.                                      | (08)    |
05    | Plan and Elevation of two room storey building.| (08)  |
06    | Multiscale Drawing.                           | (08)    |
07    | Plotting of drawing.                          | (04)    |
08    | Three Dimensional Drawing.                    | (08)    |

Total : (60)
CONTENTS:

**TOPIC: 01 – INTRODUCTION TO DRAFTING PACKAGE:**

01.01 AutoCAD- Version, Features, Methods of getting started, Opening of existing drawing, Starting of new drawing, Use of Templates, Starting Wizard, Drawing Area, Menus, Tool Bar & Starting up of drawing area.

**TOPIC: 02 – UNDERSTANDING CAD COMMANDS:**

02.01 Starting Command :- toolbar icon, flyout toolbar, Pull down menus, Keyboard menus.

02.02 Executing Commands :- Working with command prompt, line circle, Area Erase, Zoom, Break, Object Snaps.

02.03 Ending Commands :- Fillet, Donut, Offsets, Fillet, Extending, Trimming, Move, Text, Dim, Hatch, Drag, Copy, Paste, Trim etc.

**TOPIC: 03 – BASIC DRAWING TECHNIQUES:**

03.01 Relocating Entities :- Screen limits, Set units & Precision, UCS icon, Crosshair, Size option window.

03.02 Dimensioning :- Linear, Radial, Diameter and Angular Dimension.

03.03 Layers :- Layer specifications.

03.04 EntityControls :- Line type, Scale factor, Use of array and mirror commands.

03.05 W Block/Block :- Create Block files, Use of layers and Solid Commands.

03.06 Attributes :- Borders & Title Block Construction.

**TOPIC: 04 – DRAWING:**

04.01 Other Mode, Grid Command, Ellipse Construction.
04.02 Laying out the walls, Exterior Wall Lines, Interior Wall, Cutting Opening in the walls, Creating Doors etc.

**TOPIC: 05 – PLAN AND ELEVATION OF TWO ROOM STOREY BUILDING:**

**TOPIC: 06 – MULTISCALE DRAWING:**

06.01 Sealing Drawing, Proto Drawing, Floor Drawing, Wall Detail Drawing.

**TOPIC: 07 – PLOTTING OF DRAWING.**

**TOPIC: 08 – THREE DIMENSIONAL DRAWING:**

08.01 3 D Modeling, Conversion of orthographic drawing, Z-plane viewing Topographic Map Drawing, Polylines Perspective View.

**Books Recommended:**

1. Computer Fundamental. - Dr. B. Ram.
5. AutoCAD. - Rice
6. AutoCAD. - Oumera
## Scheme of Examination for Final Examination

<table>
<thead>
<tr>
<th>Types of Questions</th>
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## R. C. C. Structure

**Subject Code**

| Subject Code | 05303 |

**Theory**

<table>
<thead>
<tr>
<th>No. of Periods per week</th>
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**No. of Periods in one session**

- **60**

### Rationale & Objective:

The subject forms an important part of Civil Engineering curriculum. Concrete and steel are the most useful and versatile modern building materials.

A Civil Engineering Technician must have a sound knowledge of the subject so that he may be able to execute economical and sound design of structures by limit state design method based on specifications laid down in IS code 456-2000 in conjunction with seismic ductility detailing as per IS code 13920 and IS 4326.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Topics</th>
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<td>01</td>
<td>Loads and Stresses in R. C. C. structures</td>
<td>(04)</td>
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<tr>
<td>02</td>
<td>R. C. C. Beams(Single Reinforced)</td>
<td>(10)</td>
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<tr>
<td>03</td>
<td>R. C. C. Beams(Double Reinforced)</td>
<td>(06)</td>
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<tr>
<td>04</td>
<td>R. C. C. Flanged Beams (T &amp; L Beams)</td>
<td>(05)</td>
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<tr>
<td>05</td>
<td>R. C. C. Slabs Spanning in one direction</td>
<td>(04)</td>
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<tr>
<td>06</td>
<td>R. C. C. Slabs Spanning in two direction</td>
<td>(05)</td>
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<td>07</td>
<td>R. C. C. Columns-Axial and Bi-Axial moment</td>
<td>(10)</td>
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<td>R. C. C. Footings and Foundation</td>
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<td>09</td>
<td>Pre-stressed Concrete</td>
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<tr>
<td>10</td>
<td>Working Stress Method Design</td>
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</table>

**Total:** **(60)**
## CONTENTS:

**TOPIC: 01 – LOADS AND STRESSES IN R. C. C. STRUCTURES**

01.01 Dead Load. Live Loads. Wind Loads.
01.02 Seismic Loads, Calculation of Design Seismic force and their distribution as per IS 1893:2002
01.03 Elementary idea about effect of temperature, shrinkage and creep on R. C. C. structures, Types of reinforcements and grades of concrete, their properties and permissible stresses
01.04 Method of design of R. C. C. Sections, Assumption in Limit State method, Stress-Strain relationship for steel and Concrete, Limit state of collapse in flexure.

**TOPIC: 02 – R. C. C. BEAMS (SINGLE REINFORCEMENT) [L.S.]:**

02.01 Bending strength of singly Reinforced Beams.
02.02 Calculation of stresses developed in steel and concrete.
02.03 Design of Singly reinforced beam section. Control of deflection and slenderness Limits for Beams.
02.04 Shear strength of R. C. C. beams, R. C. C. beams with vertical stirrups with bent up bars and with inclined bars (Stirrups), Functions of shear reinforcement, Design of shear Reinforcement, Seismic hooks.
02.05 Bond in R. C. C. beams, Bond stresses, Development length of reinforced bars in Tension.
02.06 Acquaintance with IS-provisions for curtailment of Tension. Reinforcement in beams, condition for curtailment of flexural reinforcement in tension zone, special requirement near points of zero moment for curtailment of tension Reinforcement, Bar splices.
TOPIC: 03 – R. C. C. BEAMS (DOUBLY REINFORCED):

03.01 Necessity of Double Reinforced Section, location of Natural axis, Bending strength of Doubly reinforced beams.
03.02 Calculation of stresses developed in concrete and steel of Doubly reinforced beams.
03.03 Design of Doubly reinforced beam
03.04 Shear stresses in doubly reinforced beams
03.05 Acquaintance with IS provisions for curtailment of Tension. Reinforcement in beams, condition for curtailment of flexural reinforcement in tension moment for curtailment of tension Reinforcement, Bar splices.

TOPIC: 04 – R. C. C. FLANGED BEAMS (T & L BEAMS) [L.S.]:

04.01 Effective width of flange, Location of Natural axis, Lever arm for T and L sections.
04.02 Bending strength of T Beam and L Beam.
04.03 Calculation of stresses developed in concrete and steel of T-Beams and L-Beams.

TOPIC: 05 – R. C. C. SLAB SPANNING IN ONE DIRECTION [L.S.] :

05.01 Design of simply supported slab and continuous slab as per IS provision.
05.02 Design of Cantilever slabs, sunshade

TOPIC: 06 – R. C. C. SLAB SPANNING IN TWO DIRECTION [L.S.]:

06.01 Behaviour of slabs spanning in two directions with corners not held down by Grass hoff-Rankine Method.
06.02 Restrained slab with corners held down as per IS 456-1978.
Shear in Two way slab, provision of corner reinforcement, idea about different end conditions and their B. M. coefficient.

**TOPIC: 07 – R. C. C. COLUMNS- AXIAL AND BI-AXIAL MOMENT [L.S.]:**

07.01 Effective length of compression members, equivalent sectional area of columns. Radius of Gyration of column section, Slenderness Ratio of compression members, I. S. criteria for eccentricity.

07.02 Strength of long and short columns (Square, Rectangular and Circular columns).

07.03 Design of long and short columns (Square, Rectangular and Circular column with helical Re-inforcement).

07.04 Beam Column joints and their seismic ductile detailing as per IS Code-13920(latest revision)

**TOPIC: 08 – R. C. C. FOOTING AND FOUNDATION [L.S.]:**

08.01 Types of independent footing, Depth of foundation, thickness of edge of footing, Liquefaction, Mitigation of Liquefaction.

08.02 Shear force in Footing.

08.03 Design of footing for masonry and concrete wall.

08.04 Design of footing for a square and rectangular column.

**TOPIC: 09 – PRE STRESSED CONCRETE:**

09.01 Basic principle, assumption and stress diagram.

09.02 Methods of prestressing.

09.03 Advantages and disadvantages of prestressing.

09.04 General idea about losses in prestressing.
TOPIC: 10 – WORKING STRESS METHOD OF DESIGN:

10.01 Introduction and definition.
10.02 Basic assumptions.
10.03 Analysis of rectangular singly reinforced section.

Books Recommended:

**Text Books**

1. R. C. C. - J. Jha
2. ççfyr daØhV vfHkdYiu - fHkukskp ,oa fjosnh
3. ççfyr lhesaV daØhV - chñ ,uñ >k
4. R. C. C. - Agrawal
5. R. C. C. - Rama Ruthan
6. Concrete Structure for Diploma Holders - Vaziranil Ratwani
7. R. C. C. Structure Volume I - B. C. Punamia
8. Plain Reinforced Concrete - Jain
9. R. C. C. Design - Patwardhan
10. R. C. C. Theory & Design - Sah & Kale
11. R. C. C. - Malick & Gupta
12. Text Book of Concrete Technology - B. L. Gupta
13. Concrete Technology - Vaziraw & Chando
14. Concrete Technology - Gambhir
15. R. C. Structure - I. C. Syal
16. Prestressed Concrete - Vaziraw & Chando
17. Limit State Design - A. K. Jain
18. ççfyr lhesaV daØhV - xq;pj.k flag
The above table refers to the annual examinations only.
TRANSPORTATION ENGINEERING

Subject Code
05304

Theory

<table>
<thead>
<tr>
<th>No. of Periods per week</th>
<th>Full Marks</th>
<th>Annual Exam.</th>
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<tr>
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No. of Periods in one session
60

Rationale:

Transportation is vital for industrial and agricultural development of any region. Socio-economic progress is intimately linked with an efficient system of transportation of goods and people from one region to another. Transportation is, also, essential for strategic movements in case of defence emergencies. Hence construction of roads, rails & bridges form a very important job function of a civil engineering technician.

Objective:

The students will be able to:
- Define different terms in Highway, Railway & Bridge Engineering.
- Know about highways classification
- Know about the factors covering location of highways and their alignment.
- Know Sign and Signals, Traffic island, Highway Illumination, Traffic Planning and administration, No. of traffic lanes, Camber, Gradient, super elevation.
- Understand about Highway materials, Road constructions, Road drainage, Road Environment, Road maintenance.
- Know about Rails, Sleepers, Point and Crossing, Track construction, Stations and yards, Signalling and interlooking, Track maintenance.
- Know the classification of Bridges causeways and culverts, Afflux, Scour and crossings and their differences.
- Know how to align Piers, Abutment, wing walls and Approaches, Bridge Construction & Maintenance.

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<th>S.No.</th>
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<td>Highway Engineering.</td>
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<td>02</td>
<td>Railway Engineering.</td>
<td>(30)</td>
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<td>03</td>
<td>Bridge Engineering.</td>
<td>(15)</td>
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<td><strong>Total:</strong></td>
<td><strong>(60)</strong></td>
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CONTENTS:

**TOPIC: 01 – HIGHWAY ENGINEERING:** [30]

01.01 Importance & modes of Transportation, Brief history of highway developments, highway classification, Organisations & Associations.

01.02 Highway Planning & Survey: Factors influencing road planning. Factors covering location of highways and their alignment. Highway survey.

01.03 Traffic Engineering: Traffic Survey; Traffic characteristics, traffic operations, Traffic Accidents, Traffic markings, Signs & Signals; Traffic Island; Highway illumination; Traffic planning & administration.

01.04 Geometric Design: Right of way; Width of formation Width of pavement; Number of Traffic Lanes; Camber; Gradient; Super elevation & Transition; Speed; Sight distance, Methods of providing super elevation; IRC specifications.

01.05 Highway materials: Sub grade soil, Stone Aggregates; Bituminous materials, Bituminous paving Mixes; Cement concrete.

01.06 Basic description of flexible, Rigid Pavements.
01.07  Road Construction : Construction of Earth Roads; Construction of Water Bound Mocadam Roads; Construction of Bituminous pavements; Construction of Cement concrete pavements.

01.08  Road Drainage : Need for Drainage, surface & underground drainage.

01.09  Road Environment : Environmental factors in Highway planning; Arboriculture.

01.10  Road Maintenance : Road accidents, its Remedial measures.

**TOPIC: 02 – RAILWAY ENGINEERING:**

02.01  Introduction.

02.02  Permanent Way – Gauge of tracks, rails, sleepers, ballast, fixtures & fastenings.

02.03  Points & Crossing.

02.04  Track Construction.

02.05  Stations & Yards.

02.06  Signalling & Inter Locking.

02.07  Track Maintenance.

**TOPIC: 03 – BRIDGE ENGINEERING:**

03.01  Introduction – Classification of Bridges, temporary & permanent bridges, causeways & culverts.

03.02  Investigation – Site Selection; Collection of Hydraulic design data; Lineal water way; Afflux; Economical span, Scour & Erosion & their differencer.

03.03  Foundation – Scour Depth; depth of foundation, types of foundation, pile, well Raft, Caisson & Coffer Dam.

03.04  Piers, Abutment, Wing Wall & Approaches.

03.05  Bridge Constructions & Maintenance – brief idea.
Reference Books:

1. Highway Engineering - Khanna & Justo
2. Highway Engineering - Sharma & Sharma
3. I R C standard
4. Railway Engineering - N.L. Arora
5. Railway Engineering - Anita
6. Bridge Engineering - Rangwala
7. Railways, Bridge & Tunnel - N. L. Arora
8. Introduction to Bridge - N. Krishamurthy
9. Highways Engineering - Kurkarni
10. [jysos] egkekxZ ,oa iqv bZthfu:jhax & xq:pf.k flag
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13. Railway, Road & Bridge - Singhal
14. A Course In Highway Engg. - Brinda
15. Transportation Engg. - Vazirani
16. Principles of Bridge Engg. - Brinda
17. Road, Rail Bridge & Tunnel Engg. - B.L. Gupta

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

<table>
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<tr>
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Rationale and Objective:

The Subject Mechanics of Structure forms a core subject for developing the concepts required in the design of various structure. The application of theoretical principles to practical field situation is essential. Integration of the principles to field problems would help the students in understanding the concepts.

Students will be able to:
- know various elements of structures
- understand the basic principles
- analyse a given problems

apply the basic principles in the problems

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<td>01</td>
<td>Principal planes and stresses.</td>
<td>(08)</td>
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<tr>
<td>02</td>
<td>Stresses in beam.</td>
<td>(08)</td>
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<td>03</td>
<td>Combined direct and bending stress.</td>
<td>(08)</td>
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<tr>
<td>04</td>
<td>Fixed &amp; continuous beam.</td>
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<tr>
<td>05</td>
<td>Slope and deflection of beam.</td>
<td>(08)</td>
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<tr>
<td>06</td>
<td>Columns and struts.</td>
<td>(06)</td>
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<td>07</td>
<td>Torsion.</td>
<td>(06)</td>
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<td>08</td>
<td>Dams of Retaining wall.</td>
<td>(08)</td>
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</table>

Total: (60)
CONTENTS:

**TOPIC: 01 – PRINCIPLE PLANES AND STRESSES:**

01.01 Definition of principal planes and principal stresses.
01.02 Different state of stresses – Normal stresses; tangential stresses on oblique planes of a body subject to axial stresses.
01.03 Normal and tangential stresses on oblique planes of a body subjected to stresses acting on two mutually perpendicular planes with or without shear stress.
01.04 Resultant stresses on oblique plane, principal stresses and principal planes, maximum shear stress and its planes. Condition for oblique plane to be principal plane.
01.05 Analytical and graphical solutions Diagramatic representation of principal planes, Principal stresses, shear stress, Resultant Stress and its obliquity, Maximum obliquity.

**TOPIC: 02 – STRESSES IN BEAM:**

02.01 Theory of simple bending, position of neutral axis, moment of resistance. Distribution of bending stress across the section, bending stress in symmetrical and unsymmetrical section Modulus, flexural strength of a section.
02.02 Shearing stress at a section in loaded beam, Distribution of shear stresses over Rectangular, circular, I,T.-section, & Triangular sections.
02.03 Relation between maximum and average shear stress.
TOPIC: 03 – COMBINED DIRECT AND BENDING STRESS: [08]

03.01 Concept of direct and eccentric loads, eccentricity about one principal axis or both principal axis.
03.02 Stress distribution, nature of stress condition for no tension or zero stress at one extreme fibre, limit of eccentricity, Middle third rule, core or kernal of Section for various section columns.
03.03 Columns and chimney subjected to lateral wind pressure stress distribution at base.

TOPIC: 04 – FIXED AND CONTINUEOUS BEAM: [08]

04.01 Concept of fixity, effect of fixity, advantages and disadvantages.
04.02 Fixed end moments, its nature, bending moment and shear force diagrams for fixed beams of uniform section subjected to concentrated loads and uniformly distributed loads over entire span or a part of span.
04.03 Continuous beam-Introduction, theorem of three moments, concept of moment distribution method.
04.04 B.M.D & S.F.D for continuous beam with simply supported end, overhanging end span and fixed ends.

TOPIC: 05 – SLOPE AND DEFLECTION OF BEAM: [08]

05.01 Concept of slope and deflection, stiffness of beam. Slope and deflection of members subjected to pure bending moments for statically determinate beam, Relation between slope, deflection and radius of curvature.
05.02 Differential equation method of calculating deflection & slope.
05.03 Maccaulay’s method, Moment area method.
05.04 Slope & deflection for simply supported, cantilever and over hanging beam subjected to U.D.L & concentrated loads.
05.05 Introduction of propped cantilever propped at mid of simply supported for U.D.L over entire span.

**TOPIC: 06 – COLUMNS & STRUTS:**

- **06.01** Definition and classification, and condition, assumptions.
- **06.02** Buckling of axially loaded compressive members, effective length, radius of gyration, slenderness ratio.
- **06.03** Euler’s theory for long columns, buckling load, safe load, limitation of Euler’s theory.
- **06.04** Empirical formula, Rankine formula, I.S. code formula, Johnson’s formula.

**TOPIC: 07 – TORSION:**

- **07.01** Concept of torsion and twisting moment theory of pure torsion, twist angle, polar moment of Inertia. Torsional equation, Polar modulus, Torsional rigidity.
- **07.02** Power transmitted by a shaft, shear stress distribution across a section of solid and hollow circular shaft.
- **07.03** Shafts of varying section, Torsion of composite concentric shaft.

**TOPIC: 08 – DAMS & RETAINING WALL:**

- **08.01** Introduction, pressure intensity at the base of dam and retaining wall, earth pressure, angle of repose.
- **08.02** Condition of stability of a dam & retaining wall, Maximum & Minimum stress distribution at the base.
- **08.03** Middle third rule, limit of eccentricity.
Books Recommended:

1. Strength of materials - M.Chakraborti
5. Theory of Structures vol I & II - Vazirani & Ratwani
6. Strength of materials - Ramarutham
7. Strength of material Part I& II - B.N. Bose
8. Strength of materials - G.H. Ryder

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Rationale and Objective:

Environmental Engineering is the only Subject of Civil Engineering which directly related to the human health and therefore it is known as Public Health Engineering. It is also utilized to control the environment for the protection of health and comfort of all living beings on this earth as well as human being. No life can exist without water or it can be said that water is an essential for life as air is. With the rapid industrialization and abrupt growth in population increases water quantity demand and also affects its quality. The standard quality of water or portable water can not be imagined without proper sanitation. As this problem is related to the community, the environment around our society can not be untouched in Technician Education System of developing country like India in general and our State, Bihar in particular. Therefore, this subject has been divided into three groups as:-

(A) Water Supply Engineering,
(B) Sanitation Engineering, and
(C) Environmental Engineering.
The following topics with contents are capable in generating the knowledge, skill and proper attitude of technicians to provide potable water as it is not replicable and they will be able to motivate the users for adoption of Sanitary practices which will create hygienic environment.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Topics</th>
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<tr>
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<td>Quantity of Water</td>
<td>(03)</td>
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<td>03</td>
<td>Quality of Water</td>
<td>(04)</td>
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<tr>
<td>04</td>
<td>Treatment of Water</td>
<td>(11)</td>
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<tr>
<td>05</td>
<td>Conveyance &amp; Distribution of Water</td>
<td>(10)</td>
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Group-A : Water Supply Engineering  

Group-B : Sanitation Engineering  

Group-C : Environmental Engineering

Total : (60)

CONTENTS:

TOPIC: 01 – WATER SOURCES :

01.01 Need for protected water sources.
01.02 Types of water sources(Surface sources & Under ground water sources).
01.03 Factors affecting choice of water supply sources.
**TOPIC: 02 – QUANTITY OF WATER:**

02.01 Water Requirement for different purpose & B. I. S. Standards for per capita consumption of water.
02.02 Factors affecting the rate of water demand.
02.03 Different methods for estimation of population and Numerical problems associated with it.

**TOPIC: 03 – QUALITY OF WATER:**

03.01 Methods & Precautions in collecting water samples.
03.02 Water Analysis (Laboratory Method).
03.02.01 Physical Analysis.
03.02.02 Chemical Analysis.
03.02.03 Bacteriological Analysis.
03.03 Water Borne Diseases.
03.04 B.I.S. & WHO standards of potable water.

**TOPIC: 04 – TREATMENT OF WATER:**

04.01 Different types of impurities in water.
04.02 Objectives of water treatment.
04.03 Water treatment processes.
04.03.01 Sedimentation (Principle & types of sedimentation Tanks only)
04.03.02 Sedimentation with coagulation. (Necessity, principle, common coagulants and choice of Coagulant, Optimum coagulant, Dose determination, Coagulation process and its limitations only)
04.03.03 Filtration (Objects, theory and classification of filtration, comparison between slow sand Filters & Rapid sand Filters and Washing Methods of Filters only)
04.03.04 Disinfection
(Objective, criteria for a good disinfectant, Methods of
disinfection, Different Forms and classification of
chlorination only)

04.03.05 Typical Layout of a water Treatment plant.

**TOPIC: 05 – CONVEYANCE & DISTRIBUTION OF WATER:** [10]

05.01 Intake (types and selection of site only)
05.02 Different types of pipes.
05.03 Use of valve (sluice valve, Pressure Relief Valves, Check
Valves, Air Relief Valves & Drain Valves).
05.04 Description & Working Principle of Fire Hydrant.
05.05 Distribution System of Water.
(Gravity, Pumping & Dual System)
05.06 Methods of Distribution.
(Dead End, Grid Iron, Radial and Ring System).
05.07 Types of Reservoirs.
(Earth Reservoir, Masonry & R. C. C. Reservoir, Elevated
Reservoirs-Stand pipes & Elevated tanks.)
05.08 General Layout of water supply arrangements for Residential
Building only.

**TOPIC: 06 – SEWAGE DISPOSAL:** [02]

06.01 Common Technical Terms used in Sanitary Engg.
06.02 Methods of Disposal Sewage.
(Conservancy system, Water Carriage System and their
comparison)
06.03 Sewerage System
(Comparison among combined, separate & Partially separate
system only)
**TOPIC: 07 –DRAINS & SEWERS:**

07.01 Common sections of drains and sewers.
07.02 Types of Sewers & Cleaning of Sewers.
07.03 Minimum, Maximum & Self Cleaning Velocity for design of Sewers.

**TOPIC: 08 –SEWERS APPURTEANCES:**

08.01 Locations, functions & construction of Manholes, Drop hole, Street inlet, Catch Basins, Flushing Tanks, inverted syphons & Regulators.

**TOPIC: 09 –CHARACTERISTICS & EXAMINATION OF SEWAGE:**

09.01 Methods of Sampling of Sewage.
09.02 Physical, Chemical and Biological Properties.
09.03 Aerobic and Anaerobic Decomposition.
09.04 B.O.D. and C.O.D. tests.

**TOPIC: 10 –SEWAGE TREATMENT & DISPOSAL:**

10.01 Objectives of Sewage Treatment.
10.02 Classification of Treatment Processes (Preliminary, Primary & Secondary treatment including Disinfection).
10.03 Principle Description advantages & disadvantages of intermittent Sand Filters & trickling filters.
10.04 Activated Sludge Process (Concept, Operation, Advantages & Disadvantages only).
10.04.01 Methods of aeration and aerator.
10.04.02 Simple methods of sludge Disposal.
10.05 Sewage Disposal (Natural & Artificial methods).
10.06 Miscellaneous Treatment of Sewage (Oxidation Pond, Aerated Lagoons, Oxidation Ditch & Anaerobic Lagoons.)
10.07 Sanitary Latrine.
10.07.01 Various Flushing Systems.
10.07.02 Principle, Working and Design of Septic Tank including numerical problems related to the design of septic tank for different numbers of users.
10.08 Construction, Operation & Maintenance of Bio-gas Plant.

**TOPIC: 11 –ECO-SYSTEM & ECOLOGICAL BALANCE OF NATURE:**

11.01 Definition of common technical terms related to Environmental Pollution.
11.02 Water Pollution (Cause & its effects)
11.03 Air Pollution (brief idea, Classification, sources & its effect)
11.04 Noise Pollution (concept and effects on human health)

**Books Recommended:**

   - Gurucharan Singh
7. ty lEHkj.k] IQkbZ ,oa i;kZoj.k bathfu;jh
   - Gurucharan Singh
   - G. S. Birdie & J. S. Birdia
   - S. K. Hussain

Reference Books :

    - A. Kamala
11. Ground Water, Scitech Pub., Chennai-600017
    - Ramkrishnan
    - Robert Noyes
13. lkslk;Vh ,oa i;kZoj.k vfHk;kaf=dh] Standard Pub., Delhi-110006
    - K. N. Vyas
    - A. K. Upadhyay
15. Relevent B. I. S. Code, B.I.S.
    -
16. Environmental Health & Technology, Pragati Prakashan, Meerut
    - Khudesia V. P. & Khudesia Ritu
17. Water Pollution, Pragati Prakashan, Meerut
    - Khudesia V. P.
18. Air Pollution, Pragati Prakashan, Meerut
    - Khudesia V. P.
19. Physio-chemical Examination of Waste Sewage & Industrial Effluent, Pragati Prakashan, Meerut
    - Manivasakam N.
<table>
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<th>Types of Questions</th>
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The above table refers to the annual examinations only.
Earthquake Resistant Design & Construction

Subject Code
05310A

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<tr>
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Rationale & Objectives:

S.No. | Topics                                                  | Periods |
-------|---------------------------------------------------------|---------|
01     | The Earthquakes                                         | (06)    |
02     | Vibrations of Single Degree of freedom System           | (20)    |
03     | Vibration of Multiple Degrees of Freedom System         | (08)    |
04     | Earthquake Motion & Reponse                            | (06)    |
05     | Aseismic Design of Structures                           | (20)    |

Total : (60)

CONTENTS:

**TOPIC: 01 – THE EARTHQUAKES**

01.01   Earthquakes                                     | [06]    |
01.02   Epicentre, hypocentre and earthquake waves     |         |
01.03   Measurement of Ground Motion                    |         |
01.04  Cause of Earthquake (Plate tectonic)
01.05  Intensity and Isoseisms of an earthquake
01.06  Magnitude and Energy of an earthquake
01.07  Relationship of fault length, affected area and duration with magnitude
01.08  Consequences of earthquakes
01.09  Sesimic Zoning
01.10  Risk Maps
01.11  Strong Ground Motion Arrays

**TOPIC: 02 – VIBRATIONS OF SINGLE DEGREE OF FREEDOM**  [20]

**SYSTEM:**

02.01  Types of Vibrations
02.02  Degrees of Freedom
02.03  Spring action and damping
02.04  Equation of motion of single degree of freedom
02.05  Free Vibrations of Undamped systems having single degree of freedom
02.06  Combination of stiffnesses
02.07  Vibration of Damped System having single degree of freedom
02.08  Dry Friction Damping
02.09  Negative Damping
02.10  Forced Vibration of a Undamped System
02.11  Forced vibrations of a damped system
02.12  Equivalent viscous damping
02.13  Vibration isolation
02.14  Vibration Measuring Instruments
02.15  System subjected to transient forces
TOPIC: 03 – VIBRATION OF MULTIPLE DEGREES OF FREEDOM

03.01 Introduction
03.02 Two Degrees of freedom
03.03 Many degrees of freedom
03.04 Forced vibration – earthquake excitation

TOPIC: 04 – EARTHQUAKE MOTION AND RESPONSE:

04.01 Introduction
04.02 Strong motion earthquakes
04.03 Numerical method for spectra
04.04 Elastic spectra
04.05 Ground velocity and displacement
04.06 Inelastic spectra

TOPIC: 05 – ASEISMIC DESIGN OF STRUCTURES:

05.01 Design data and philosophy of design
05.02 Multistorey Buildings(G+2) Design-Analysis Design
05.03 Earthquake resistant construction of buildings
05.04 Ductility provisions in reinforced concrete construction
05.05 Base Isolation
05.06 Capacity building Design and Pushover Analysis
05.07 Retrofitting of Buildings

Books Recommended:

1. Earthquake Resistant Design & Analysis - Jai Krishna.
2. Dynamic of Structures - Mario Paz.
6. Dynamics of Structures - Claugh & Penzien.
<table>
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<tr>
<th>Types of Questions</th>
<th>DISTRIBUTION OF MARKS</th>
<th>Total Marks</th>
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The above table refers to the annual examinations only.
## Computer Application Lab. (CADD)

### Subject Code

| 05311 |

### No. of Periods in one session

| 60 |

#### Practical

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### Scheme of Examination for Final Examination

F.M. : 40

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<tr>
<th>S.No.</th>
<th>Topics</th>
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<tbody>
<tr>
<td>01</td>
<td>Drawing.</td>
<td>02</td>
</tr>
<tr>
<td>02</td>
<td>Plan and Elevation of two room storey building.</td>
<td>03</td>
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<tr>
<td>03</td>
<td>Multiscale Drawing.</td>
<td>01</td>
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<tr>
<td>04</td>
<td>Plotting of drawing.</td>
<td>01</td>
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<tr>
<td>05</td>
<td>Three Dimensional Drawing.</td>
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Hydraulics and Irrigation Engineering

Subject Code 06307

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Rationale & Objective:

This subject “Hydraulics & Irrigation Engineering” is one of the important papers of civil engineering which can be utilised in improving the basic occupation i.e. Agriculture of the rural area as depends on water also. The hydraulics deals with the effect of water in both hydrostatic & kinetic stage as well as characteristics of flowing in open channel as well as irrigation explains the basic concept of applications of fluid flow problems in wide variety of irrigation structures like canal, canal Head works, Regulatory and Cross Drainage works etc. To ensure a correct and economical design of an irrigation system an engineer must be acquainted with the aspect of irrigation as well as principle of Hydraulics.

The knowledge and skill of Hydraulics & Irrigation will create an appropriate attitude of technicians of Civil Engineering (Rural) towards solving the basic needs of Agriculture of Rural areas.

With this objectives, this subject is divided into two groups-Group A & Group B. Group A deals with the topics of Hydraulics whereas Group B contains the topics of Irrigation. The details of topics are as follows:
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Topics</th>
<th>Periods</th>
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<tbody>
<tr>
<td>01</td>
<td>Hydrostatics.</td>
<td>(08)</td>
</tr>
<tr>
<td>02</td>
<td>Buoyancy.</td>
<td>(05)</td>
</tr>
<tr>
<td>03</td>
<td>Hydro-Kinematics.</td>
<td>(05)</td>
</tr>
<tr>
<td>04</td>
<td>Measurement of flow.</td>
<td>(07)</td>
</tr>
<tr>
<td>05</td>
<td>Flow through open channel.</td>
<td>(05)</td>
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<tr>
<td></td>
<td><strong>Sub Total A</strong> :</td>
<td><strong>(30)</strong></td>
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<tr>
<td>06</td>
<td>Hydrology.</td>
<td>(08)</td>
</tr>
<tr>
<td>07</td>
<td>Lift of Flow Irrigation.</td>
<td>(05)</td>
</tr>
<tr>
<td>08</td>
<td>Head Works.</td>
<td>(05)</td>
</tr>
<tr>
<td>09</td>
<td>Irrigation.</td>
<td>(07)</td>
</tr>
<tr>
<td>10</td>
<td>Miscellaneous topics.</td>
<td>(05)</td>
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<tr>
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<td><strong>Sub Total B</strong> :</td>
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</tbody>
</table>

**CONTENTS:**

**GROUP-A : HYDRAULICS**

**TOPIC: 01 – HYDROSTATICS :** [08]

01.01  Brief study of fluid properties like density, Specific weight, Compressibility, Surface Tension, Viscosity and Vapour Pressure.

01.02  Knowledge of units & dimensions of various parameters like discharge, pressure, pressure head, energy and power.
01.03 Total liquid pressure, intensity of pressure and pressure head. Laws of liquid pressure, Atmospheric pressure, Gauge pressure, Negative pressure and absolute pressure.

01.04 Measurement of pressure by Simple Manometer, Differential Manometer and inverted manometer only.

01.05 Total pressure & centre of pressure including its location for horizontal, vertical and inclined surfaces.

01.06 Pressure Diagram for different cases.

01.07 Simple numerical problems based on above topics.

01.08 Basic idea of forces on vertical dam, walls & gates (excluding numerical problems).

**TOPIC: 02 – BUOYANCY:**

02.01 Buoyant force and centre of buoyancy.

02.02 Kinds of equilibrium of a floating body stable, unstable and neutral equilibrium.

02.03 Meta centre and Meta centric Height, Analytical & experimental determination of Meta centric Height.

02.04 Simple numerical problems based on above topics.

**TOPIC: 03 – HYDRO-KINEMATICS:**

03.01 Types of flow-Definition & basic concept of Laminar & Turbulent flow, steady & non-steady flow, sub critical & Super critical flow and compressible & non-compressible flow. Reynold number, Froude number & webber number (definition only).

03.02 Definitions & basic idea of Datum head, Velocity head, pressure head & total head. Equation of continuity for one dimensional steady flow. Assumptions statement explanation & limitations of Bernoulli’s equation. Application of Bernoulli’s equation.
<table>
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<tr>
<th>Topic</th>
<th>Description</th>
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<tbody>
<tr>
<td>03.02.01</td>
<td>Venturimeter- coefficient of Venturimeter &amp; Discharge of Venturimeter.</td>
</tr>
<tr>
<td>03.03</td>
<td>Simple numerical problems related to above topics.</td>
</tr>
<tr>
<td><strong>TOPIC: 04 – MEASUREMENT OF FLOW:</strong></td>
<td></td>
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<tr>
<td>04.01</td>
<td>Definitions of coefficient of contraction, coefficient of discharge and coefficient of velocity including their relation.</td>
</tr>
<tr>
<td>04.02</td>
<td>Definitions and types of orifices and notches as well as weirs. Flow through Rectangular, triangular and trapezoidal notches. Velocity of approach and its effect.</td>
</tr>
<tr>
<td>04.03</td>
<td>Loss of head due to friction in pipe-Darcy’s equation. Loss at sudden enlargement and sudden contraction of cross section of pipe. Miscellaneous losses in pipe flow.</td>
</tr>
<tr>
<td>04.04</td>
<td>Simple numerical problems related to above topics.</td>
</tr>
<tr>
<td>04.05</td>
<td>Hydraulic Gradient line &amp; total energy line, simple idea of water hammer and hydraulic jump, Specific energy diagram. (Excluding numerical problems)</td>
</tr>
<tr>
<td><strong>TOPIC: 05 – FLOW THROUGH OPEN CHANNEL:</strong></td>
<td></td>
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<tr>
<td>05.01</td>
<td>Steady uniform flow through rectangular and trapezoidal channels.</td>
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<tr>
<td>05.02</td>
<td>Chazy’s &amp; Manning formula.</td>
</tr>
<tr>
<td>05.03</td>
<td>Channel of most economical section-Rectangular &amp; Trapezoidal section.</td>
</tr>
<tr>
<td>05.04</td>
<td>Simple numerical problems related to above topics.</td>
</tr>
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</table>
GROUP-B : IRRIGATION

TOPIC: 06 – HYDROLOGY:

06.01 Hydrological Cycle- Concept & details component. Rainfall and its measurement by automatic & non-automatic rain gauges. Average rainfall over catchment. Run Off- factors affecting run off & determination of flood discharge including of run off.

06.02 Hydrograph - definition, types and its application in determination of run off.

TOPIC: 07 – LIFT OF FLOW IRRIGATION:

07.01 Irrigation method, necessary, advantages, disadvantages & limitations of Lift irrigation in particular.

07.02 Yield of open well-Pump test & Recharge Method. Determination of Yield of wells from Darcy’s law- confined & unconfined aquifers. Technical terms related to well hydraulics. Simple numerical problems related to this topic.

07.03 Types of canal, canal alignment & typical cross section of canal. Design of regime irrigation canals by Lacy’s & Kennedy’s theory. Simple problem based on these methods of design. Canal lining- purpose, advantages & disadvantages.

TOPIC: 08 – HEAD WORKS:

08.01 Diversion Head Works- Definition, Objects, General layout of a division head works. Function of divide wall, under sluice, fish ladder, head regulator & approns etc.
08.02  Storage Head Works- Types of Dams, essential characteristics of dam with their component parts. Condition of stability of dam. Seepage in earthen dam & its control. Functions & elementary idea of spillways & gates.

**TOPIC: 09 – IRRIGATION:**

09.01  Cross Drainage works- Function, its types.
09.02  Head Regulators, Cross Regulators, falls & escapes.
09.03  River Training works-Functions & Methods only.

**TOPIC: 10 – MISCELLANEOUS TOPICS:**

10.01  Sprinkling Irrigation.
10.02  Siltation in Canal- causes & remedy.
10.03  Water logging- causes & preventive measures, reclamation of water logged areas.
10.04  Soil Conservation Methods.
10.05  Watershed Management.
10.06  Causes of Floods and its management.
Books Recommended:

5. nzo bathfu;jh ,oa nzo pkfyr e’khu, Standard - B. L. Gupta Publishers Distributors, Delhi
7. Irrigation & Water Power Engg., Standard - Dr. B. C. Punamia Publishers Distributors, Delhi

SCHEME OF EXAMINATION FOR FINAL EXAMINATION F.M. : 80

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Rationale and Objective:

India is predominantly an agricultural country with more than 80% of its population living in about 60 lacs village in the country. The spectacular advancement otherwise achieved in science and technology have not been properly harnessed for improving the quality of life of the rural poor. A huge investment in terms of men, material and capital has gone into a variety of rural development programmes, but they have not been able to make any significant change of the formidable problems of rural poverty and unemployment.

The necessity of having technical manpower properly trained in rural technology and management at appropriate levels can not be over emphasized.

<table>
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<td>Community Development.</td>
<td>(02)</td>
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<tr>
<td>02</td>
<td>Appropriate technological option for rural extension.</td>
<td>(08)</td>
</tr>
<tr>
<td>03</td>
<td>Definition &amp; concept of process and product development.</td>
<td>(04)</td>
</tr>
<tr>
<td>04</td>
<td>Virgin &amp; Waste land.</td>
<td>(03)</td>
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<tr>
<td>05</td>
<td>Reclamation programme.</td>
<td>(04)</td>
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<tr>
<td>06</td>
<td>Promotion of improved Agricultural Technique and Land utilization.</td>
<td>(04)</td>
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</table>
07 Equipment used in Technology transfer. (04)
08 A Powerful aid to mix farming techniques (Animal Husbandry). (06)
09 Development of fruit cultivation. (06)
10 Development of Village handicrafts leading to employment. (04)
11 Arboriculture development of social forest for fuel wood. (05)
12 Communication. (03)
13 Community Health & Hygiene. (04)
14 Adult Education. (03)

Total: (60)

CONTENTS:

TOPIC: 01 – COMMUNITY DEVELOPMENT:

01.01 Meaning and objective of community development role of technical institution particularly polytechnics and community polytechnics in the field of community development: Objectives.

TOPIC: 02 – APPROPRIATE TECHNOLOGICAL OPTION FOR RURAL EXTENSION:

02.01 Concept of appropriate technology, appropriate technological options in the fields of farm machinery and post harvest, soil and water conservation irrigation including drip irrigation and rain harvesting, Rural water management community health & hygiene & Rural transport, Rural housing Draught Animal Power, rural industries etc.
TOPIC: 03 – DEFINITION & CONCEPT OF PROCESS AND PRODUCT DEVELOPMENT:

03.01 Definition & concept of process and product development of community need based items.
03.02 Defining technology transfer concept components of technology invention, innovation and dissemination of information.

TOPIC: 04 – VIRGIN & WASTE LAND:

04.01 Survey of available virgin and waste lands.

TOPIC: 05 – RECLAMATION PROGRAMME:

05.01 Mobilisation of local people on co-operative basis.
05.02 Irrigation facilities to the reclaimed land with the help of existing system or by other method impounded reservoirs which has a dual water pisci-culture.

TOPIC: 06 – PROMOTION OF IMPROVED AGRICULTURAL TECHNIQUE AND LAND UTILIZATION:

06.01 Reclaimed land utilized for a pilot project on improved land utilization by a varied crop patterns.
06.02 Provision for improved seed farm catering the area.

TOPIC: 07 – EQUIPMENT USED IN TECHNOLOGY TRANSFER:

Various communication option for effecting technological transfer at the grass root level.
07.01 Mass Communications/motivational approach & techniques.
07.01.01 Mass Media including Radio, T.V., V.C.R.
07.01.02 Print Media including pamphlets, brochures, booklets etc.
07.01.03 Workshop, Seminar Symposium folk dance & drama song role plan, sheet plans contact drive on special occasion.

07.02 Demonstration & Exhibition of technological options to be transferred.

**TOPIC: 08 – A POWERFUL AID TO MIX FARMING TECHNIQUES (ANIMAL HUSBANDRY):**

08.01 Concept of mixed farming.

08.02 Rearing of cattle and other domestic animals sheep and goats, piggery etc.

08.03 Direct economic bearing of mixed farming.

08.04 Farm wastes (non marketable positions) used for fodder as well as for composing the residue with animal excreta, Bio gas generation.

**TOPIC: 09 – DEVELOPMENT OF FRUIT CULTIVATION.**

09.01 Management of fruit garden.

09.02 Fruit rearing techniques.

09.03 Fruit harvesting and marketing.

09.04 Fruit preservation.

09.05 Fruit canning industry as a cottage industry-employment of women folk.

**TOPIC: 10 – DEVELOPMENT OF VILLAGE HANDICRAFTS LEADING TO EMPLOYMENT:**

10.01 Manufacture of mats-baskets.

10.02 Manufacture of bed spreads cotton blankets (stiched old clothes in beautiful pattern like quits).

10.03 Manufacture of papad or other products for urban kitchen made of lentil paste.
Mixed pickles James, Jellies or the like leading to a guillotine on the distress gole of form products during pick harvesting period.

**TOPIC: 11 – ARBORICULTURE DEVELOPMENT OF SOCIAL FOREST FOR FUEL WOOD:**

11.01 Indiscriminate deforestation due to a great dearth of cheap fuel wood.
11.02 Burning animal dung in form of cakes losing its other valuable potential.
11.03 Land hither to be coming out of use due to excessive moisture storage is very suitable for cultivation of deciduous trees which consumes enormous amount of moisture and grow quickly.
11.04 Elements from community septic tank can be discharged on such land solving social problems.

**TOPIC: 12 – COMMUNICATION:**

12.01 Improvement and maintenance of existing village roads by adopting new techniques.
12.02 Development of improved animal driven cart for efficiency and preventing damage to rural roads.

**TOPIC: 13 – COMMUNITY HEALTH & HYGIENE:**

13.01 Environmental up lift for general improvement of health.
13.02 Hygiene and public health awareness.
13.03 House to house health training for effective motivation.
13.04 Responsibility of schools.
TOPIC: 14 – ADULT EDUCATION:  

14.01 Establishment of night school for adult literacy and education.
14.02 Audio signal programme for effective motivation.

Books Recommended:


SCHEME OF EXAMINATION FOR FINAL EXAMINATION

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The above table refers to the annual examinations only.
Agricultural Engineering & Extension Services

Subject Code
06309

Theory

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No. of Periods in one session: 60

Rationale and Objective:

A Rural Engineering Diploma holder have to perform his duty in rural mass to deal with modern & scientific methods of Agricultural production from cultivation to food processing with special emphasis on the machinery, implements and sources of power, operation & its maintenance etc. used in Agricultural Sector.

The present syllabus have been prepared, keeping in view the above objectives and its fulfillment:

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<th>S.No.</th>
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<td>01</td>
<td>Farm Machinery &amp; Equipments.</td>
<td>(10)</td>
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<tr>
<td>02</td>
<td>Farm Energy Sources.</td>
<td>(12)</td>
</tr>
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<td>03</td>
<td>Farm Processing Machinery.</td>
<td>(06)</td>
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<tr>
<td>04</td>
<td>Farm Buildings.</td>
<td>(06)</td>
</tr>
<tr>
<td>05</td>
<td>Irrigation &amp; Drainage.</td>
<td>(06)</td>
</tr>
<tr>
<td>06</td>
<td>Soil &amp; Water Conversion Engineering.</td>
<td>(06)</td>
</tr>
<tr>
<td>07</td>
<td>Concept &amp; Philosophy of Rural Development and Extension Services.</td>
<td>(04)</td>
</tr>
<tr>
<td>08</td>
<td>Existing Infrastructure for Rural Extension.</td>
<td>(04)</td>
</tr>
<tr>
<td>09</td>
<td>Role of Voluntary Agencies in Rural Extension.</td>
<td>(04)</td>
</tr>
<tr>
<td>10</td>
<td>Financing Institution for Rural Development.</td>
<td>(02)</td>
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Total : (60)
CONTENTS:

TOPIC: 01 – FARM MACHINERY & EQUIPMENTS:

01.01 Status of Farm Engineering and its utilisation in Indian Agriculture.
01.02 Scope of Mechanisation in India.
01.03 Tillage & Tillage equipments.
01.04 Purpose of tillage, primary and secondary tillage equipments.
01.05 Details of farm equipments-plough, machines & other equipments used in India.
01.06 Their role in Agricultural practices with respect to conventional modern and scientific methods of agriculture.

TOPIC: 02 – FARM ENERGY SOURCES:

02.01 Energy sources and internal combustion engine.
02.02 Power Tiller and Mini Tractors.
02.03 Tractors and their different systems (in brief.).
02.04 Selection of Agricultural machines, Tractors and other equipments for various categories of land holding.
02.05 Land levelling techniques field layout and machine operation maintenance.
02.06 Dry Farming.
02.07 Plant protection equipments and machinery.

TOPIC: 03 – FARM PROCESSING MACHINERY:

03.01 Seed treatment and planting equipments.
03.02 Harvesting thressing cleaning, grading, processing machine; their description, operation, maintenance and repair arrangements, availability of parts.
TOPIC: 04 – FARM BUILDINGS:

04.01 Farm thressing floor, farm implements seed, farm working repair and maintenance cell, farm pump house, channel construction of farm manager/engineer office, dairy barn system housing, poultry housing piggery, grain and fodder storage systems & their space requirement, desing and construction of water supply and drainage resources.

04.02 Rural Sanitation.

04.03 Rural and farm electric machines its installation.

04.04 Bio/Gobar Gas plants, details of including its construction.

TOPIC: 05 – IRRIGATION & DRAINAGE:

05.01 Water Requirement of plant, duty, delta, base period, monga factor and water distribution systems, water utilisation, efficiency, command area.

05.02 Irrigation methods.

05.03 Drainage systems.

05.04 Well, Tube well, Wind mill, Pump Unit, installation methods, constructions, pump details, repair and maintenance in brief.

TOPIC: 06 – SOIL & WATER CONSERVATION:

06.01 Soil erosion, its agencies and types.

06.02 Water erosion-conservation systems.

06.03 Wind erosion-conservation system including agronomical management system.

06.04 Quality of water for drinking and irrigation purposes.

06.05 Pollution of water and soil and its prevention control system, tree plantation etc.
TOPIC: 07 –CONCEPT AND PHILOSOPHY OF RURAL DEVELOPMENT AND EXTENSION SERVICES:

07.01 History of Rural Development in India, brief account of various efforts made by official and non-official agencies changing emphasis on rural development policies and programme during five year plans, comparative achievements of five year plans, extension efforts during various plans.

TOPIC: 08 –EXISTING INFRASTRUCTURE FOR RURAL EXTENSION:


TOPIC: 09 –ROLE OF VOLUNTARY AGENCIES IN RURAL EXTENSION.

09.01 Rural development and extension activities covered by financial institutions, their infrastructure and effectiveness.

TOPIC: 10 –MISCELLANEOUS TOPICS:

10.01 Rate of Financing Institution for Rural Development like CAPART, SIDA(Swedish International Development Agency), Agha Khan Foundation, Rajiv Gandhi Foundation and others.
Books Recommended:

4. Bij Sansadhan, G. B. Panta Agri. & Tech. - Ram Prakash Saxena University, Pant Nagar(U.P.)
5. Krishi Abhdiyantrik, G. B. Panta Agri. & Tech. - Dr. H. R. Chauhan University, Pant Nagar(U.P.)

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

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The above table refers to the annual examinations only.
Rationale and Objective:

Management of small scale industry and services organisations:

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<th>Topics</th>
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<tr>
<td>01</td>
<td>Place of small scale industry.</td>
<td>(12)</td>
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<tr>
<td>02</td>
<td>Assisting Organisation.</td>
<td>(15)</td>
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<tr>
<td>03</td>
<td>Procedure to get loan.</td>
<td>(15)</td>
</tr>
<tr>
<td>04</td>
<td>Source of Finance.</td>
<td>(04)</td>
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<tr>
<td>05</td>
<td>Market Analysis.</td>
<td>(04)</td>
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<tr>
<td>06</td>
<td>Preparation of TEFR.</td>
<td>(04)</td>
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<tr>
<td>07</td>
<td>Availability of Raw Material.</td>
<td>(04)</td>
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<tr>
<td>08</td>
<td>Basic Concepts of Marketing.</td>
<td>(02)</td>
</tr>
</tbody>
</table>

Total: (60)
CONTENTS:

TOPIC: 01 – PLACE OF SMALL SCALE INDUSTRY :

01.01 Definition of S. S. Industry, Cottage Industry and Ancillary Unit. Scope of S. S. Industry. Current Industrial Policy resolution relating to cottage and small scale industry.

01.02 Procedure for setting up a small scale industry.

01.02.01 A list of certain items having a good market, early to manufacture, labour intensive and requiring less space.

01.02.02 Steps for organising the industry (project profile, feasibility report, concept and its format study).

TOPIC: 02 – ASSISTING ORGANISATIONS:

02.01 A. CENTRAL LEVEL.

(a) Small Scale Industry Development Corporation, Cottage Industries Services Institute.

(b) Khadi Village Industries Commission.

(c) Central Small Scale Industries Board.

(d) National Small Industries Corporation.

(e) Small Industries Services Institute.

B. STATE LEVEL

(a) State Industries Directorate.

(b) State Financial Corporation.

(c) Banks.

(d) State Industrial Co-operative Banks.

TOPIC: 03 – PROCEDURE TO GET LOAN:

03.01 Industrial Estate-Objectives.

03.02 Facilities available.
03.03 Short notes on facilities available like Hire purchase of machinery, procurement of raw materials, utility services, market assistance etc.

03.03.01 Selection of Site:-Availability of land, road, electricity, raw materials, labour, machinery.

03.03.02 Financial Analysis:-Fixed capital, working capital, cost analysis of product, break even print.

03.03.03 Preparation of project profile, feasibility report, concept & its format study.

**TOPIC: 04 – SOURCE OF FINANCE:**

04.01 Name of Financial Institution.

04.02 Procedure to obtain Finance.

04.03 Limitation to be provided by financial institution.

**TOPIC: 05 – RECLAMATION PROGRAMME:**

05.01 Market Analysis:-Market survey for demand and available sources of supply of product to be produced.

**TOPIC: 06 –PREPARATION OF TEFR:**

06.01 Preparation of TEFR( Technical Economical Feasibility Report).

**TOPIC: 07 –AVAILABILITY OF RAW MATERIAL:**

07.01 Availability of Raw Materials in Rural Area, its uses of exports.

**TOPIC: 08 –BASIC CONCEPT OF MARKETING:**

08.01 Basic concepts of marketing, Sales promotion and motivation.
Books Recommended:

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The above table refers to the annual examinations only.
Rural Resource Management

Subject Code
06310C

Theory

No. of Periods in one session
60

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Full Marks : 100
Annual Exam. : 80
Internal Exam. : 20

Rationale and Objective:

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<td>Principles of Management.</td>
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<td>02</td>
<td>Rural Financial Management.</td>
<td>(10)</td>
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<td>03</td>
<td>Personal Management.</td>
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<td>04</td>
<td>Staff Structures of Different Rural Organisations.</td>
<td>(30)</td>
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CONTENTS:

**TOPIC: 01 –PRINCIPLES OF MANAGEMENT:** [10]

01.01 Role of management in rural development.
01.02 Preference of rural organisations.
TOPIC: 02 – RURAL FINANCIAL MANAGEMENT:

02.01 Role of Banking organisations in Banks of rural areas.
02.02 Meaning and significance of long term and short term loans.

TOPIC: 03 – PERSONAL MANAGEMENT:

03.01 Concepts of personnel management, aims and objectives.
03.02 Characteristics of good personnel policy.

TOPIC: 04 – STAFF STRUCTURES OF DIFFERENT RURAL ORGANISATIONS:

04.01 Staff structures of different rural nodal organisations working in rural area such as Block offices, Panchayat Samity, Gram Panchayat Office, Krishi Vigyan Integrated Children Development Scheme (I.C.D.S.), Non-Governmental Organisations (N.G.O.) etc.
04.02 Selection technique, different procedures, Job Description, Application Forms, Employment Tests, Interviewing, Physical Examinations, Induction and Orientation.
04.03 Training objectives, need for training, methods of training concept of Good Housekeeping and its necessity, advantages and procedure.
04.04 Multi-disciplinary management programme and organisation farm as business w. r. t.
   (i) Engineering Management,
   (ii) Agronomrical Engineering,
   (iii) Economical,
   (iv) Social,
   (v) Environmental.
04.04.01 Principles and theories applied to farm Economics.
04.04.02 Cost concept and cost of cultivation and production economics and tools of farm management, Analysis and planning.

**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

**F.M. : 80**

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The above table refers to the annual examinations only.
Horticulture and Social Forestry

Subject Code: 06310

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Rationale and Objective:

Agriculture commission has stated that the country has reached a stage which land needed for agricultural purposes could not be used for afforestation. Likewise the forest land could not be diverted for agricultural purposes Social forestry could meet this challenge. Hence we have no alternative but to shift to the so called waste lands through massive social forestry programmes.

The rural technician are expected to work in rural area. They should be aware of horticulture & social forestry systems, science & technology involved in horticulture and social forestry. The rural technician should be able to appreciate input of science & technology in farm sector and the village.

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<td>Vegetable Growing.</td>
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<td>03</td>
<td>Fruit Growing.</td>
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<td>04</td>
<td>Kitchen Gardening.</td>
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<td>05</td>
<td>General Plant Protection.</td>
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<tr>
<td>06</td>
<td>Importance of trees and forests.</td>
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</table>
TOPIC: 01 – ECONOMICAL AND NUTRITIONAL IMPORTANCE OF FRUITS AND VEGETABLES.

TOPIC: 02 – VEGETABLE GROWING:

02.01 Types of vegetable farming, Nursery management and transplanting of vegetable, classification of vegetable, improved methods of cultivation of major vegetable crops, potatoes, chillis, brinjal, cauliflower, cabbage, onion garlic, ladies fingers, spinach, beans & peas, mushroom etc.

TOPIC: 03 – FRUIT GROWING:

03.01 Fruit Growing:- Classification of fruits, establishment of an orchard layout propagation, digging of pits, pit manuring planting, planting distances, pruning soil management of orchards plant harvesting and marketing of fruits, Improved methods of cultivation of major fruit crops, Mango, Guava, Citrus fruits, papaya, grapewine, Banana, Jack fruit etc.

03.01.01 Non-seasonal growing of vegetables.

TOPIC: 04 – KITCHEN GARDENING:

04.01 Kitchen gardening, Biodynamic system of growing vegetable crops.
TOPIC: 05 – GENERAL PLANT PROTECTION:

05.01 General Plant Protection measures for fruit and vegetable crops.
05.01.01 Vegetable and fruit preservation.

TOPIC: 06 – IMPORTANCE OF TREES AND FORESTS:

06.01 Economical cultural and social importances of trees and forests in India and their relationship with rural development.

TOPIC: 07 – SOCIAL FORESTRY:

07.01 Concept of social forestry and its usefulness for rural masses. Selection of suitable plants for different purposes and areas, importance of lucena (Subahool) and eucalyptus in social forestry.

TOPIC: 08 – MANAGEMENT OF NURSERIES FOR SOCIAL FORESTRY.

TOPIC: 09 – COMMUNITY PLANTATION

09.01 Planning, Management and Utilization.

TOPIC: 10 – POLICY FRAME WORK FOR SOCIAL FORESTRY PROGRAMME:

10.01 Policy frame work for social forestry programme. Facilities made available by the Government for this purposes.
TOPIC: 11 – NON-GOVERNMENTAL ORGANISATION:  

11.01 Non-Governmental Organisation and people’s participation in social forestry programmes. 

Books Recommended:

1. Science & Technology for rural development, S. - B. C. Chottopadhyay Chand & Company Ltd.
2. Role of Agro-forestry in improving environment - G. B. Singh Indian Farming
3. Hand Book of Agriculture, Indian Council of Agricultural Research, New Delhi 

SCHEME OF EXAMINATION FOR FINAL EXAMINATION F.M. : 80

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Micro-Level Planning of Water Resource Project

Subject Code
06310E

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No. of Periods in one session: 60

No. of Periods per week
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Rationale:

Since independence, vast tracts of land have been brought under irrigation command in Bihar. But the utilization of entire irrigation potential has remained much below the expectation. One of the principal reasons for poor utilization has been identified as the absence of suitable micro level planning below outlet, Socio-cultural, economic status and technical competency of the farmers have restricted them from constructing suitable micro-distribution system. Therefore, the technicians, working in the water resource department should be able to investigate, plan design and construct a micro-distribution system.

Objective:

The broad objectives of this paper are the following:-

1. Students should be able to assess the crop water requirement based on climatological approach modified penman method.
2. They should be able to know the important crops of Bihar. Their duration and stages of growth etc.
3. They should be able to determine the delivery rate for a particular set of cropping pattern.
4. They should be able to investigate, plan and design the micro level network of water-distribution system.
5. They should know the scientific water distribution system e.g. warabandi, RWS, Tatil and Satta system etc.
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<td>02</td>
<td>Basic Concepts of Soil Science.</td>
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<td>04</td>
<td>Water Distribution Methods.</td>
<td>(03)</td>
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<td>05</td>
<td>Survey and Farm Roads.</td>
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<td>06</td>
<td>Water Application Methods and their efficiencies.</td>
<td>(03)</td>
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<td>07</td>
<td>Land Leveling and Land consolidation.</td>
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<td>08</td>
<td>Basics of Agronomy.</td>
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<td>09</td>
<td>Drainage of Irrigated Agriculture.</td>
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<td>Farmer’s Participation.</td>
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<td>Miscellaneous Topics.</td>
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**CONTENTS:**

**TOPIC: 01 – CROP-WATER REQUIREMENT:**

01.01 Importance of study of soil-water-plant relationship.
01.02 Water requirement of crops various methods including duty delta concept.
01.03 Consumptive and evapo-transpiration
01.04 Modified penman method of calculating reference crop evapo-transpiration with an example.
01.05 Cropping pattern and cropping intensity.
01.06 Crop duration, crop stages and crop coefficient.
01.07 Crop evapo-transpiration
01.08 Effective Rainfall.
01.09 Net Irrigation Requirement (NIR), Field Irrigation Requirement (FIR) and Gross Irrigation Requirement (GIR).
01.10 Evolving Delivery Schedules.
TOPIC: 02 – BASIC CONCEPT OF SOIL SCIENCE:

02.01 Soil characteristics for agricultural purposes.
02.02 Various soil moisture conditions such as temporary and permanent wilting points, Field capacity and management allowed deficit.
02.03 Irrigation scheduling and canal operation strategies.
02.04 Infiltration characteristics.
02.05 Soil survey for irrigation purposes.
02.06 Soil and land irritability classification.
02.07 Soil texture, texture classes and application of soil texture in water and land management

TOPIC: 03 – MICRO LEVEL PLANNING:

03.01 Micro Level Planning-concept layout of chaks, sub-chaks, Water courses, field channels, field drains, farm roads and Turnouts.
03.02 Structures in water course water measurement devices V-notch and cut-throat flumes.

TOPIC: 04 – WATER DISTRIBUTION METHODS:

04.01 Rotational Water Distribution System.
04.02 Warabandi System.
04.03 Tantil System.
04.04 Satta System.

TOPIC: 05 – SURVEY AND FARM ROADS:

05.01 Topographical Survey, Aireal Survey, Grid Survey, Field to-field grid survey.
05.02 Farm roads planning design and specification link roads planning, design and specification other roads-planning, design and specification.
TOPIC: 06 – WATER APPLICATION METHODS AND THEIR EFFICIENCIES:

TOPIC: 07 – LAND LEVELLING AND LAND CONSOLIDATION:

TOPIC: 08 – BASICS OF AGRONOMY:
Important irrigated agricultural crops in Bihar and Comprehensive description of their agronomical aspects such as

08.01 Seeds.
08.02 Fertilisers and manures.
08.03 Pesticides, insecticides and weedicides.
08.04 Crop Calendar and cropping pattern.
08.05 Root zone of crops.
08.06 Critical stages of Crop growth.
08.07 Irrigation requirement (data not methodology)

TOPIC: 09 – DRAINAGE OF IRRIGATED AGRICULTURE:

09.01 Introduction of farm drainage system, soil salinity, water logging.
09.02 Classification of drainage methods.
09.03 Investigation, planning, construction and maintenance of farm drainage system (including both surface and sub-surface drains).

TOPIC: 10 – FARMER’S PARTICIPATION:

10.01 Motivation of farmers for better water and land management.
10.02 Farmers organisation for better water use and farmer’s participation.
TOPIC: 11 – MISCELLANEOUS:

11.01 Types of outlets.
11.02 Flow measurement.
11.03 Seepage loss study.
11.04 System and conveyance efficiency.
11.05 Watershed Management.
11.06 Drip Irrigation.
11.07 Sprinkler Irrigation.
11.08 Conjunctive use of Water.

Books Recommended:

2. Special course on Diagnostic, Analysis of minor irrigation schemes, Publication no. 11, WALMI, Aurangabad (M.S.)
3. On Farm Development work including Micro-Distribution, Publication no, 12, WALMI, Aurangabad (M.S.)
### Scheme of Examination for Final Examination

<table>
<thead>
<tr>
<th>Types of Questions</th>
<th>DISTRIBUTION OF MARKS</th>
<th>Total Marks</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Test Knowledge</td>
<td>Test Skill</td>
</tr>
<tr>
<td>Objective type</td>
<td>10</td>
<td>05</td>
</tr>
<tr>
<td>Short Answer type</td>
<td>05</td>
<td>10</td>
</tr>
<tr>
<td>Long Answer type</td>
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<td>10</td>
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<tr>
<td>Total Marks</td>
<td>35</td>
<td>25</td>
</tr>
</tbody>
</table>

The above table refers to the annual examinations only.
Rationale and Objectives:

The civil engineering laboratory is a subject which will help student to understand the theory that he has studied by performing experiments and verifying results. Besides the above the objective of the course are to develop measuring skills, skill to observe experimental date, put the data in a tabular form, draw graphs, read the graph and analyse the result. It will bring confidence in a student.

CONTENTS:

Preparation of Journal based on any eight experiments of the following:-

01 Determination of fineness modular of fine aggregate.
02 Determination of fineness modular of course aggregate.
03 Determination of bulking the sand.
04 Determination of Thickness index and elongation index of aggregate.
05 Determination of Normal consistency of cement.
06 Determination of Intial setting time of comment.
07 Determination of Final setting time of comment.
08 Determination of Soundness of comment.
Determination of tensile strength of cement after 3 days & after 7 days curing.

Determination of compressible strength of concrete after 7 days; 14 days & 28 days of curing of M 15 grade of concrete.

Slump test.

Determination of turbidity of water.

Determination of PH value of water.

Determination of flash point of bitumen by a bell’s flash point appraption or by pensky master apparatus.

Determination of softening point of bituminous material by Ring and Bell apparatus.

Determination of consistency of bituminous material by penetration test.

Abrasion test of road material.

Books Recommended:

1. Lab manual for soil mechanics, material testing, - Water & Bitumen. standard publishers & distributors Delhi.

2. Material testing lab manuals. - Kanshik.


SCHEME OF EXAMINATION FOR FINAL EXAMINATION F.M. : 40
Rationale and Objectives:

The experimental verification of the analytical analysis is very essential in case of establishing Hydraulic Structure. The objective of this curriculum is to build up confidence among the technicians in the application of Principles of Hydraulics. The technicians will also be able to find out the experimental errors which normally occurs.

CONTENTS:

Journal based on any Eight experiments, performed in the laboratory is to be prepared.

01 Measurement of pressure by piezo meter / Mano meter.
02 Verification of Bernauli’s theorem.
03 To find out discharge through venturi meter.
04 Determination of $C_v$, $C_c$ & $C_d$.
05 Determination of coefficient of Discharge through a rectangular notch.
06 Determination of coefficient of Discharge through a triangular notch.
07 Determination of coefficient of Discharge through a trapezoidal weir.
08 Determination Metacentric Height.
09 Determination of loss of head due to friction for given pipeline.
10 Determination of velocity Head by Pilot tube.
11 Study of working Principle of Centrifugal pump.
12 Study of working principle of Reciprocating pump.
13 Study of working principle of pelton wheel.
14 Study of working principle of Francis Turbine.

Books Recommended:

1. Laboratory Experiment in Fluid Mechanics, - K. R. Arora
2. Books recommended in theory paper -

SCHEME OF EXAMINATION FOR FINAL EXAMINATION     F.M. : 40
Rationale and Objectives:

The civil engineering laboratory is a subject which will help student to understand the theory that he has studied by performing experiments and verifying results.

Besides the above the objective of the course are to develop measuring skills, skill to observe experimental date, put the data in a tabular form, draw graphs, read the graph and analyse the result. It will bring confidence in a student.

CONTENTS:

Preparation of Journal based on any eight experiments of the following:-

01 Determination of fineness modular of fine aggregate.
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07 Determination of Final setting time of comment.
08 Determination of Soundness of comment.
<table>
<thead>
<tr>
<th>No.</th>
<th>Test Description</th>
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</thead>
<tbody>
<tr>
<td>09</td>
<td>Determination of tensile strength of cement after 3 days &amp; after 7 days curing.</td>
</tr>
<tr>
<td>10</td>
<td>Determination of compressible strength of concrete after 7 days; 14 days &amp; 28 days of curing of M 15 grade of concrete.</td>
</tr>
<tr>
<td>11</td>
<td>Slump test.</td>
</tr>
<tr>
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<td>Determination of turbidity of water.</td>
</tr>
<tr>
<td>13</td>
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<tr>
<td>14</td>
<td>Determination of flash point of bitumen by a bell’s flash point appraption or by pensky master apparatus.</td>
</tr>
<tr>
<td>15</td>
<td>Determination of softening point of bituminous material by Ring and Bell apparatus.</td>
</tr>
<tr>
<td>16</td>
<td>Determination of consistency of bituminous material by penetration test.</td>
</tr>
<tr>
<td>17</td>
<td>Abrasion test of road material.</td>
</tr>
</tbody>
</table>

**Books Recommended:**

1. Lab manual for soil mechanics, material testing, - Water & Bitumen. standard publishers & distributors Delhi.
2. Material testing lab manuals. - Kanshik.
Inplant Training and Visit to Works

Subject Code  

06316

Sessional

No. of Periods in one session  

4 weeks continuous

No. of Periods per week

L T P/S

Full Marks : 100

Annual Exam. : 60

Internal Exam. : 40

Rationale :

A student is required to develop his knowledge skill and attitudes gained while joining through different course. It is desirable to expose the students to the world of work to be familiar with the real life situations and understand the problem there in.

The “In plant training and visit to work “being introduced for the final year diploma technicians for Civil (Rural) Engineering with the above objective in view. This course will help the students to observe how the technical, managerial, quality control safety and other principle are being applied in real life situation. They will be able to observe the technique of decision making on the shop floor. He will also, be able to observe the technique of decision making on the shop floor. He will, also be able to observe how his sub-ordinate perform in their day to day work and co-ordinate shop floor activities. The course will also, help bring attitudinal changes in a student.

Objective:

A student will be able to:

- Understand the working of the machines, tools and equipments more clearly.
- Write down the specifications of the machines, tools, equipments.
- Know the process of material storing / material management.
- Learn to maintain office records / filing.
- Know the process of planning, implementation and monitoring.
Learn the skill shop floor co-ordination.
Know the skill of office management and inventory Control.
Understand the process of production.
Know the skill of quality control.
Know the organizational set-up and plant Layout.
Locate the plants and industries related to Civil (Rural) Engineering State and Nation wise.
Find out Characteristics, Functions, and activities of those industries.
Find out opportunities and method of recruitments.
Know the source of raw materials and markets for industries.
Find out the special characteristics of the industries.
Observe and understand special machines, which they may not have been in their institutes.
Observe the energy consumption in on industry method to same energy.
Try to learn techniques to same energy.
Observe the environment Pollutants and learn how to minimize environmental Pollution.

CONTENTS

Part-A

Inplant Training

The training of the students should be in any organisation, which is involved in :

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Civil construction work.</td>
</tr>
<tr>
<td>02</td>
<td>Civil Design work.</td>
</tr>
<tr>
<td>03</td>
<td>Irrigation.</td>
</tr>
<tr>
<td>04</td>
<td>Planning &amp; Erection.</td>
</tr>
<tr>
<td>05</td>
<td>Any other which is relevant to civil Engineering.</td>
</tr>
</tbody>
</table>
## Part-B

### Visit to Works

Project studies (Visit to works): Journal in respect of study of any TWO of the following Project:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Topics</th>
</tr>
</thead>
</table>
| 01    | An Irrigation Project:-  
- Study of different elements of a Dam/Barrages,  
- Site including river training works,  
- Silt excluder,  
- Divide wall,  
- Head regulator,  
- Scour Slice gates,  
- Intake of main canal  
- Cross Regulators  
- Cross Drainage Works  
- Spillway, etc. |
| 02    | A multi storeyed Framed Building Project under construction:  
- Study of different components of Buildings including  
- Sub-structure and super-structure  
- Study of re-inforcement used in different members,  
- Details of concrete sections,  
- Details of joints,  
- Construction  
- Planning  
- Erection Technique |
A reinforced cement concrete or a pre-stressed concrete of a steel:
- Bridge project
- Study of different members
- Support conditions
- Connection between members
- Details of Joints
- Associated River traning works

A Road project under construction:
- Alignment of Road
- Data of sub-structures and super structures of Road
- Study of geometrical elements & junctions

A water supply scheme:
- Study of works at source
- Water Purification system
- Water testing devices
- Storage system
- Pumping system
- Supply net-work

A Sewerage System:
- Study of collection system
- Sewer network
- Pumping station
- Sewerage Treatment Plant
- Disposal of sludge and water

A Railway Station Yard:
- Study of Railway Yard including Plot form
- Tracks
- Signals
- Interlocking system
- Points & Crossings
- Regulation of Rolling stock

REPORT WRITING:

Report writing The report on each project/ scheme shall include sketches, wherever necessary, of all works studied with relevant data.

SCHEDULE FOR TRAINING:

- Planning/Office Management - One Week
- Shop floor - Two Weeks
- Testing/Quality Control/Stores - One Week

SCHEME OF EXAMINATION

Marks Distribution

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>40 %</td>
</tr>
<tr>
<td>Regularity</td>
<td>10 %</td>
</tr>
<tr>
<td>Discipline</td>
<td>10 %</td>
</tr>
<tr>
<td>Report</td>
<td>10 %</td>
</tr>
<tr>
<td>Viva</td>
<td>10 %</td>
</tr>
<tr>
<td>External</td>
<td>60 %</td>
</tr>
<tr>
<td>Report/Journal</td>
<td>20 %</td>
</tr>
<tr>
<td>Viva</td>
<td>40 %</td>
</tr>
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</table>
Project Work and its Presentation in Seminar

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Code</th>
<th>Sessional</th>
</tr>
</thead>
<tbody>
<tr>
<td>06317</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of Periods per week</th>
<th>Full Marks</th>
<th>Annual Exam.</th>
<th>Internal Exam.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>60</td>
<td>40</td>
</tr>
</tbody>
</table>

Rationale:

Projects are intended to provide students with an ability to tackle new problems with inquisitiveness. The project is included in the course to develop skill to plan, organize, conduct survey, investigate, collect relevant course and will also provided an opportunity to develop skill to integrate knowledge and skill gained while going through other subjects.

Objective:

The students will be able to develop skill to:

- Plan.
- Organise.
- Conduct survey.
- Investigate.
- Collect relevant data.
- Take decision.
- Prepare a project or technical report.
- Present the report before a seminar.
S.No. | Topics
--- | ---
01 | Road project.  
02 | Other project.

**CONTENTS**

**TOPIC: 01- ROAD PROJECT :**

01.01 ½ Kilometer length:  
The road project (Rural areas) will be allotted to the student by the faculty in charge of the project.

**TOPIC 02 : -OTHER PROJECT (ANY ONE FROM THE FOLLOWING) :**

02.01 Bridge Project (S. L. R. bridge).  
02.02 Irrigation project (Barrage project/Dam project/Canal project Tube well project).  
02.03 Drainage project (one village / command of one outlet/ small chour 100 hectares).  
02.04 Water supply scheme – one village (minimum ten houses).  
02.05 Sanitary engineering scheme one village (minimum ten houses).

The above mentioned Project Report will include the following:

1. Location survey.  
2. Reconnaissance survey.  
3. Investigation & survey work.  
4. Design and Office work (generally based on studies in theory subjects. (In case of design work beyond the syllabus.).  
5. Preparing working drawing, estimating materials, Drawing section, layout plans, Schematic diagrams plans and elevations, other details.  
7. Construction planning.

Project work/ project report should be presented in the form of a seminar for developing confidence and communication skill among the students.

NOTE:-

For completion of Project Work a duration of two weeks at a stretch will be provided.

Project work will be allotted to the students just in the beginning of the session. Each student will be give a separate work under the supervision of a teacher. Total number of students may be divided among the number of teachers available. The teacher concerned will select separate problem for each student under him and allot it to him at the beginning of the session. Problems selected should preferably conform to the syllabus. If it is outside of the syllabus then it must be within the field of Civil (Rural) engineering.

References:

1. I. S. codes and manuals.
2. Text Books of concerned subjects.
GOVERNMENT OF BIHAR
DEPARTMENT OF SCIENCE & TECHNOLOGY

STATE BOARD OF TECHNICAL EDUCATION
BIHAR, PATNA

COURSE OF STUDY
FOR
PART - III Diploma
IN
Civil (Rural) Engineering
THREE YEARS DIPLOMA COURSE
# Provisional

## Scheme of Teaching and Examination for 3-years (w. e. f. Session 2001-2004) of PART-III DIPLOMA in CIVIL (RURAL) ENGINEERING BRANCH

### THEORY

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>SUBJECTS</th>
<th>SUBJECT CODE</th>
<th>TEACHING SCHEME</th>
<th>EXAMINATION - SCHEME</th>
</tr>
</thead>
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<tr>
<td></td>
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<td></td>
<td>Periods per week</td>
<td>Periods in one session (year)</td>
</tr>
<tr>
<td>1.</td>
<td>Professional Studies &amp; Entrepreneurship</td>
<td>00301</td>
<td>03</td>
<td>60</td>
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<tr>
<td>2.</td>
<td>CADD</td>
<td>05302</td>
<td>03</td>
<td>60</td>
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<tr>
<td>3.</td>
<td>R. C. C. Structures</td>
<td>05303</td>
<td>03</td>
<td>60</td>
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<td>4.</td>
<td>Transportation Engineering</td>
<td>05304</td>
<td>03</td>
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<td>5.</td>
<td>Mechanics of Structure</td>
<td>05305</td>
<td>03</td>
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<td>6.</td>
<td>Environmental Engineering</td>
<td>05306</td>
<td>03</td>
<td>60</td>
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<td>7.</td>
<td>Hydraulics &amp; Irrigation Engineering</td>
<td>06307</td>
<td>03</td>
<td>60</td>
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<tr>
<td>8.</td>
<td>Community Development &amp; Appropriate Technology</td>
<td>06308</td>
<td>03</td>
<td>60</td>
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<tr>
<td>9.</td>
<td>Agricultural Engg. &amp; Ext. Services</td>
<td>06309</td>
<td>03</td>
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<td>10.</td>
<td><em>Elective</em></td>
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<tr>
<td></td>
<td>(A) Earthquake Resistant Design &amp; Construction</td>
<td>05310(A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(B) Village Industries and Services Organisation</td>
<td>06310(B)</td>
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<td></td>
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<td></td>
<td>(C) Rural Resource Management</td>
<td>06310(C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(D) Horticulture &amp; Social Forestry</td>
<td>06310(D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(E) Micro Level Planning and Water Resource Project</td>
<td>06310(E)</td>
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Total :- 1000

### PRACTICAL

<table>
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<th>Sr. No.</th>
<th>SUBJECTS</th>
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<th>TEACHING SCHEME</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Periods per Week</td>
<td>Periods in one session (Year)</td>
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<tr>
<td>11.</td>
<td>CADD Lab.</td>
<td>05311</td>
<td>03</td>
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<tr>
<td>12.</td>
<td>Civil Engineering Lab.</td>
<td>06312</td>
<td>02</td>
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<td>13.</td>
<td>Hydraulics Lab.</td>
<td>06313</td>
<td>02</td>
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Total :- 150

(i)
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<td>Periods per week</td>
<td>Periods in one session (Year)</td>
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<td>14.</td>
<td>Civil Engg. Lab.</td>
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<td>60</td>
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<td>15.</td>
<td>Professional Studies &amp; Entrepreneurship</td>
<td>00315</td>
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<tr>
<td>16.</td>
<td>In Plant Training &amp; Visit to Work (Preferably 4 weeks)</td>
<td>06316</td>
<td>(4 weeks in one session)</td>
<td>-</td>
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<tr>
<td>17.</td>
<td>Project Work &amp; Its Presentation in Seminar</td>
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<td>(2 weeks in one session)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Total :-</strong></td>
<td><strong>350</strong></td>
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Total Periods per Week | 42 | Total Marks = 1500