

# 1061 – CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP

6Hours/Week

14 Weeks

84 Hours

## UNIT – 1.

15 Hours

### 1.1 Introduction

Definition of construction management – Need for construction management – Scope of construction management.

### 1.2 Building Economics

Definition – Factors; design factors; shape of building; Circulation space, Structural form, Prefabrication ( Modular Co-ordination), Site utilization, Coverage, Density of development, Effect of contours, Maintenance consideration.

### 1.3 Integrated Management System

Need – Typical network format of precontract planning, Land development for building construction, Check list for information flow of drawing, Material management chart, Construction program for Mass housing – Classification of construction work, Light, Heavy and industrial.

### 1.4 Planning of Civil Engg Project

Preliminary planning – Factors to be considered – Reconnaissance survey – Preliminary survey – Analysis and plotting of data - Preliminary estimate – Project report – land acquisition – Administrative approval – Technical sanction – Budget provision.

### 1.5 Organisation Structure of Construction Department

Different Engineering Organisations in State & Central administrative set up – Duties and responsibilities of officers – Chief Engineer – Superintending Engineer – Divisional / Executive Engineer – sub divisional officer – Section officer - Classes of Establishment – Permanent – Temporary –Work charged. Power of sanction of project for P.W.D. officers – Classes of establishment.

## UNIT – 2

20 Hours

### 2.1 Resource Management

Definition – Need for resource management – Optimum utilization of resources Finance, Materials, Machinery, Human resources, Labour legislation, Safety in civil Engg. works, Resource leveling, Resource scheduling. Construction Planning; Construction stages – Construction Operations – Construction Schedule – Materials – Equipments and Machinery – Labour – Programme and progress chart – Gantt charts – Uses and limitations – 'Work study in construction industry for better utilization of resources and progress control.

### 2.2 Application of Network techniques

CPM and PERT networks- Advantages – Network concept – Activities – Dummy activities – Events – Networks Preparation – Numbering the Events – Time Estimates – Activity oriented time estimate – Event oriented time estimate – Floats – Project completion time and Critical path – Part time estimates – Expected time – Standard deviation and variance – comparison between PERT and CPM – Network problems.

## **Unit 3**

**16 Hours**

### **3.1 Tenders and Tender Documents :**

Definitions – Sealed tender – Tender documents – Tender notice – Earnest money deposit – Security Deposit – Opening of tenders – Scrutiny of Tenders – Acceptance of Tenders – Works orders – Contract documents – Execution of agreement – General and specific conditions.

### **3.2 Contracts :**

Contract system – Different types of contract – forms of contract – piece work agreement – Lumpsum contract – item rate or unit price contract – cost plus percentage contract – merits and demerits – Negotiated rates – sub contract – procedure for enlisting of contracts – Legal implication of contract – Penalties and Arbitration.

### **3.3 Departmental Execution of works:**

Necessity – Nominal muster roll – rules for preparation of muster roll – Daily labour report – Out turn of work – casual labour work.

### **3.4 Supervision and Quality control :**

Need and scope for quality control – specifications and standards - Quality control on materials – sampling and testing of materials – Supervision by section officer – site order book .

## **Unit 4**

**16 Hours**

### **4.1 Measurement and Quality control :**

Measurement books – Recording of measurements – Check measurement – Pre-measurement – unit of measurement of work

### **4.2 Bills**

Definition of bills – types of bill – First and final bill – Running account bill – lumpsum contract bill – hand receipt – types of payment – preparation examination and payment of bill – contractors ledger account – completion report – refund of deposits – cash book maintenance – imprest cash account – Temporary imprest account.

### **4.3 Stores**

Classification of stores – maintenance of stock accounts – materials at site account – Transfer entry order – Tools and plant account – Safe custody of stores – inspection of stores – accounting for surplus and stores –Dealing with railway for conveyance.

## **Unit 5.**

**12 Hours**

## 5.1 Entrepreneurship

Definition and concept – role and significance – Risks and awards – profile and requirement of an entrepreneur development – Need for coordinated efforts – Follow up and institutional support needed – Programmes Existing in India – SISI, DIC, TIIC, SIDCO - Assistance programs to entrepreneurs small business enterprises – forms of business enterprises – sole proprietorship – partnership – private limited company – public limited company – cooperative – state enterprises (Definition only)

## 5.2 Finance

Role of Bank in the development of small business enterprises – Elements of cash flow – Cash inflow and cash outflow – cash flow diagram – time value of money – interest rate of capital – present value of computation – calculation of net present value and profitability index – Graphical computation rate of return – problems.

**Revision and Test**

**5 Hours**

### **Reference Books :**

- |  |   |
|--|---|
| Construction Management                  | - S. Sanga reddy<br>& P.L. Meiyappan, DOTE publications   |
| Elements of Construction Management      | - TTTI , Chennai, Oxford university press<br>Publications |
| PERT and CPM principles and applications | - East west publications , Delhi                          |

**7 Hours/week**

**14 weeks**

**98 Hours**

**UNIT-1**

**9 Hours**

**1.1 QUANTITY OF WATER**

Water supply-need for protected water supply-importance of public water supply schemes-demand-types of demand-domestic demand, industrial and commercial demand, demand for public uses, fire demand, demand for compensating various losses-per capita demand-design period-methods of forecasting population-problems in arithmetical increase method geometrical increase method, incremental increase method-total quantity of water required for villages /towns-sources of water-surface and sub surface sources-selection of suitable source for a water supply scheme-sanitary protection of wells.

**1.2 COLLECTIONS AND CONVEYANCE OF WATER**

**8 Hours**

Intake-types of intakes- description of reservoir intake, river intake-infiltration galleries and infiltration wells in river beds-necessity of pumps-types-choice of types of pumps- conveyance of water-methods-pipe materials cast iron, steel, G.I, cement concrete and R.C.C, hume and P.V.C pipes-advantages and disadvantages of different pipes-joints in pipe lines-laying and testing of pipe lines-corrosion of pipes and leakages-effects-prevention of pipe corrosion.

**UNIT-2**

**2.1 QUALITY OF WATER**

**8 Hours**

Impurities in water-Sources, causes and effects of different types of impurities-Tests on water-Physical, Chemical and Bacteriological tests-Significance of various tests conducted on water-Sampling of water-standards laid down by B.I.S.I for drinking water-W.H.O standards -Maintenance of purity of water- water borne diseases and their causes.

**2.2 TREATMENT OF WATER**

**10 Hours**

Layout of treatment plants-sedimentation with coagulation-common coagulants Used and their choice-Types of sedimentation tanks-Filtration -theory of filtration-Types of filters-Description and design of Rapid sand Filters for small towns-Disinfection of water-methods- Chlorination-Forms of chlorination-Dosage of chlorine-Hardness – Types of Hardness-Removal of hardness of water-Lime soda process and Zeolite process-Miscellaneous methods of water treatment-Removal of odour and taste-Removal of iron and manganese - Flouridation and deflouridation - Mineral waters – requirements – Treatment processes – Reverse Osmosis process.

**UNIT -3**

**3.1 DISTRIBUTION SYSTEM**

**8 Hours**

Different systems of supplying water-Gravity system, pumping system and combined system-continuous and intermittent supply of water-comparison -Different layouts of distribution systems-Dead end, Grid iron, Radial and Circular systems-Merits, demerits and suitability of different layout systems-Service reservoirs-Underground and over head tanks

**3.2 APPURTENANCES AND MAINTENANCE OF WATER LINES**

**9 Hours**

Service lines to houses-Diagrammatic sketch showing the connection of service line to street line - Different water supply fittings used in buildings and their uses - Appurtenances used in the distribution system - Sluice valves, Check valves, Air valves, Scour valves, Fire hydrants and Water meters - wastage of water-detection methods - Preventive measures – Maintenance of distribution system.

## **UNIT-4**

### **4.1 COLLECTIONS AND CONVEYANCE OF SEWAGE**

**10 Hours**

Sanitation-purpose-Definition of terms-sewage, sewer, sewerage, sullage, refuse and garbage -properties of sewage-Methods of carrying waste water-water carriage system-Quantity of sewage-Variation in rate of flow of sewage-Estimation of quantity of sewage-problems-Minimum size of sewer-shapes of sewer-circular and non circular shapes (names only)- Reasons for selecting circular shapes-Gradient of sewer lines -minimum and maximum velocities in sewers-Materials used for sewers-Laying of sewer lines-Joints in sewer lines- Testing of sewer lines-Ventilation of sewers-cleaning of sewers-sewer appurtenances – manhole – lamp hole – catch basin – Flushing tank – Street inlet and their uses-Drainage arrangement in buildings-Sanitary fittings-W.C., Flushing cisterns, Traps-Maintenance of House drainage system – Sewage pumps – Types of sewage pumps (names only).

### **4.2 TREATMENTS AND DISPOSAL**

**10 Hours**

Schematic diagram of sewage treatment plant-Treatment of sewage-Primary and secondary treatments - Screens - Skimming Tanks -Grit chambers - Sedimentation Tanks - Standard rate and High rate Trickling filters - Activated Sludge process -Septic Tanks for isolated buildings - Locations - Components and working of Septic Tanks - Design of Septic Tank for houses and Institutional buildings - Disposal of Septic Tank effluent - Soak pits, Dispersion Trenches - Sludge disposal - methods -Oxidation ponds -Use of treated effluent.

## **UNIT-5**

### **5.1 ENVIRONMENTAL POLLUTION AND CONTROL**

**10 Hours**

Environment – Definition – Water Pollution - Sources of water pollution - Effects and prevention of water pollution.

Water Management - Measures for reshaping local water balance – Use and Conservation of Water Resources - Need of Rain Water Harvesting - Methods of Rain Water Harvesting.

Land Pollution - Sources of Land Pollution - Effects and prevention of Land Pollution - Pollution impact on land due to non -biodegradable waste matters (Polythene bags, P.V.C. & other plastic materials, Glass, etc.,) - Remedial measures.

Air Pollution – Classification of Air Pollutants - Sources - Natural and Man made sources - Effects of Air Pollution on human beings, animals, plants and materials – Control of Air Pollution - At sources - Equipment control – Different Equipments to control Air Pollution - Settling chambers, Cyclone filters, Scrubbers and Electrostatic precipitators - Green House effect - Ozone layer depletion – Acid Rain – Environmental Legislations.

### **5.2 INDUSTRIAL WASTE WATER TREATMENT AND SOLIDWASTE DISPOSAL**

**8 Hours**

Industrial waste – Principles of Industrial waste water treatment - List of Industries producing harmful Wastewater - Water Pollution by Industrial Waste water - Different ways of Industrial Waste water disposal - Common measures used for Industrial Waste pre-treatments (Process change, Recovery of materials, Reuse technique, Mixing of trade waste to adjust pH) - Treatment Processes usually adopted for Industrial Waste Water – Tanneries – Textile mills – Sugar mills - (Flow Diagram and Description only) - Solid Waste - Disposal of Solid waste - Necessity - Collection and Conveyance of Solid waste - Methods of Solid waste disposal - Incineration, Dumping, Sanitary landfill and Composting.

### **Revision and Test**

**8 Hours**

**REFERENCE BOOKS:**

1. WATER SUPPLY AND SANITARY ENGINEERING (Including Environmental Engineering)  
By G.S.BIRDIE
2. FUNDAMENTALS OF WATER SUPPLY AND SANITARY ENGINEERING  
By S.C.RANGWAL & K.S. RANGWALA
3. WATER SUPPLY ENGINEERING  
By SANTHOSH KUMAR GARG
4. SANITARY ENGINEERING  
By SANTHOSH KUMAR GARG
5. ENVIRONMENTAL ENGINEERING TEXT BOOK  
Prepared by TTTI-TARAMANI, CHENNAI.
6. INDUSTRIAL WASTE WATER TREATMENT  
By RAO & DUTTA
7. INDUSTRIAL WATER POLLUTION, ORIGIN CHARACTERISTICS AND TREATMENT  
By N.L. NEMEROW
8. AIR POLLUTION  
By, M.N. RAO & H.V. RAO

## 1063. a - IRRIGATION ENGINEERING

### (ELECTIVE THEORY- II)

7 Hrs/Week

14 Weeks

98 Hours

#### UNIT-1.

17 Hours

##### 1.1. Introduction :

Definition-Necessity-Methods of Irrigation-Free Flooding, Border Flooding, Check Flooding, Basin Flooding, Furrow Flooding, Sprinkler Flooding – Types of Irrigation – Direct - River / Canal irrigation Storage or Valley Irrigation –Sub soil or Lift Irrigation – Advantages of Irrigation – Development of Irrigation in India.

##### 1.2. Crops and Duty of Water

Cropping seasons-Rabi&Kharif; Types of Crops – Rabi& Kharif; Cash crops, dry crop, wet crop – Definition of - Duty , Delta, Crop period, Base period-Factors affecting duty – Importance of duty- Relation between duty and delta- Problems.

##### 1.3. Hydrology

Definition – Hydrological cycle – Rainfall – Definition- Average annual rainfall, Normal rainfall, Maximum annual rainfall, Minimum annual rainfall – Characteristics of Indian rainfall – Rain gauges – Non automatic and Automatic Rain Gauges - Simon's Rain gauge – Isohytes – Runoff- Factors affecting Runoff – losses- Estimation of runoff – Ingress and Khosla's formulae Stream gauging – methods of determining maximum rate of run off- High flood discharge formulae – Dicken's and Ryve's Formulae- Hydrograph -uses.

#### UNIT-2.

18 Hours

##### 2.1. Storage Works

Definition- surface storage – Reservoir – tank – purpose of surface storage – Storage Head works- components, Dam - Lake- Lake Basin- Storage capacity of lake- Evaporation and absorption losses- Height of Dam – Site selection for a Dam – Types of Dams - Solid gravity Dams- Masonry, plain Cement Concrete dams, Earth Dams, Rockfill dams, steel dams, Timber dams- Storage dams, diversion dams, Detention dams.

##### 2.2. Gravity Dams

Forces causing stability and instability – uplift pressure – Modes of failure and criteria for structural stability – Elementary Profile– High & Low gravity dams – Practical Profile of a dam – Factors to classify low or high dam. Construction of drainage gallery – Functions and types of drainage Gallery – sketches – contraction joints– sketches.

##### 2.3. Earth Dams

Types – Homogeneous, Non homogeneous, Diaphragm –Puddle core wall, Masonry core wall – sketches – causes of Failures.

## **UNIT-3**

**18 Hours**

### **3.1. Spillways, Gates & Sluices**

Definition – functions of Spillways – Types – Over fall, Saddle, emergency, spillway ; profile of over fall spillway (Ogee crest)- Saddle spill way- Emergency spillway – Breaching section – Profiles.

Spillway gates – fixed Roller gate – Radial gate.

Sluices : Tower head and Wing wall type.

### **3.2. Diversion Works**

Definition – Weir and Barrage – Differences – Gravity and Non gravity Weirs – Lay out of diversion works – Types of Weirs – Masonry weirs with vertical slopes – Rockfill weirs with sloping aprons –Modern concrete weirs with sloping glaciers – Factors governing the design of weirs –afflux – Pond level – Scouring sluices – divide walls – definitions & Functions: Fish ladders, Various types with their cross sections – head regulator- Definition & purpose – Typical section of a Head regulator – silt excluders and silt ejectors.

## **UNIT – 4**

**18 Hours**

### **4.1. Distribution Works**

Canals – Alignment – Types: Water shed canal, Contour canal, Side slope canal – Balancing depth of cutting – Sketches & Formulae – Simple problems – distribution system for canal irrigation – Main canal, Branch Canal, Distributories (Major & Minors) – Lay out of a canal system – showing Canal head works and Head regulator – Limiting velocity, Critical velocity ratio, Kennedy formula- Layout of inundation canal – Canal system - Typical cross section of Irrigation canals in cutting, infilling, in partial cutting and filling – Balanced depth of cutting / filling - Berms, Free Board, Banks, Service Road, Dowla, Back berm or contour Berm, Spiral Bank.

### **4.2 .Lining of Irrigation Canals**

Definitions – Necessity – economics of canal lining – Permissible velocities in lined canals – Various types of lining ( hard surface and Earth type) – Factors responsible for selection of a particular type – Cement concrete, Brick , Asphalt concrete, Compacted earth soil cement – Under drainage of lined canals.

## **UNIT – 5**

**18 Hours**

### **5.1. River Training Works**

Necessity – functions – High water, Low water, Mean Water training works – Marginal Embankments, Guide Banks – Principles and Factors governing the design of guide Banks – Spurs or groynes – Types of alignment- Length and spacing- Types of groynes – Impermeable and permeable groynes, T-shaped groynes, Hockey shaped groynes – Pitching of Banks – Pitched Islands.

## 5.2. Cross Drainage Works

Definition – Necessity – Aqueduct and siphon aqueduct- Super passage and siphon super passage – level crossing – Inlet and Outlets- Selection of a suitable type of cross drainage works – types of Aqueducts and syphon aqueducts.

## 5.3 .Well/Lift Irrigation

Wells and their constructions – open wells or dug wells- Cavity formation in wells, Types and construction of open wells – Yield of an Open well – Pumping and Recuperating tests – Wells with pervious & Impervious Lining – Tube wells – Types – Strainer, cavity and slotted – Typical section with all components – Lifting of water – Wind mills, Centrifugal Pumps – Advantages and disadvantages of tube well Irrigation over canal Irrigation.

## REVISION AND TEST

**9 Hours**

### **REFERENCE BOOKS**

- |                                    |                                 |
|------------------------------------|---------------------------------|
| 1.Irrigation Engg.                 | -V.P.Sundaram , DTE Publication |
| 2.Irrigation Engg                  | - Priyani                       |
| 3.Irrigation Engg.                 | - Shahane & Iyengar             |
| 4.Irrigation Engg.                 | - Punmia.                       |
| 5.Irrigation Engg.                 | – N.N.Basak                     |
| 6.Fundamentals of Irrigation Engg. | - Bharat Singh                  |
| 7. Principles of Irrigation Engg   | - S.K.Sharma.                   |
| 8. Irrigation Engg Manual          | - Col. Ellis                    |

## **1063 b - TOWN PLANNING** (Elective Theory - II)

7 Hours / Week

14 Weeks

98 Hours

### **UNIT – 1 :**

#### **TOWN PLANNING PRINCIPLES**

**16 Hours**

Introduction– objectives – principles– Necessity – origin of towns - forms of planning – representation techniques - Neighbourhood Layout – Master plan - Planning concept of Le-Corbusier, Gardencity – E.Howard & C.A. Doxia Das. Preparation of Neighbourhood Layout.

### **UNIT – 2 :**

#### **ROAD AND STREET PLANNING**

**17 Hours**

Planning principles and Techniques – Objectives of – Road, Street ; - types - Classification of Street Systems – Road Junction – parking – Road and street layout including details of road junction.

Traffic Management – Street lighting - Regional Road and Arterial Road – Subarterial road – local streets – Off street parking spaces- foot path – cycle tracks.

Plantation of Shrubs, Trees and Greenery - norms for planning of shrubs and trees –types of plants –distance between trees Effects of plant on environmental protection.

### **UNIT - 3 :**

#### **HOUSING**

**18 Hours**

Demand draft for housing – Classification - residential buildings - Housing Policies and programmes in India – Various agencies of housing and their operation – Housing Finance – Role of HDFC, LIC, HUDCO & Banks. Economic and administrative policies in housing programmes – New Developments – Housing Layouts – CMDA guidelines – Tamilnadu Town & Country Planning Rules – Urban Land Ceiling Act – Problem of redevelopment and slum clearance – Sites and services schemes – Organisation of Construction Industry – Co-operative societies, Housing boards.

Planning of Landscape Architecture for Residential areas – Salient features.

### **UNIT - 4 :**

**18 Hours**

#### **ECONOMY, SOCIETY, ENVIRONMENT AND TRANSPORT POLICY AND PLANNING**

Production of the Built Environment - relationships between economy, society and the built environment - relationships and conflicts between developers, planners, architects, designers and builders.

Transport Policy and Planning - ranges over the technical problems involved in transport analysis and planning -need to travel, patterns of trip-making and modes of travel and the policy issues surrounding transport.

**TOWN PLANNING RULES, BUILDING BYE-LAWS & DEVELOPMENT CONTROL RULES**

Necessity of framing town planning rules and bye-laws - Principles involved – objectives – Local bye-laws - Local bye-laws as compared to NBC-1983 - Zoning – Principle – objective -Use of zones – Height zones – Density zones – Density – Net density –Gross density – Local density – Calculation of density for a given area -Study of local bye-laws and local zoning plans as applied to residential buildings – Salient features of Tamilnadu Town and Country Planning Act - Multi-storied and public building – parking space – Technical Terms – Land use – Plot – Site plan – F.A.R. - Plot coverage - F.S.I, Set back, Carpet area, plinth area, Light plane – TDR floating F.S.I. – Green belt.

Importance of framing building bye-laws – Study of Tamilnadu State building Bye-laws in the design and layout of buildings with reference to Tamilnadu State Building Rules – Development Control Rules – General Rules as applied to a Metropolitan Area – CMDA rules.

***Revision & Test***  
***11 Hours*****Reference Books :**

1. National Building Code of India- Part-III.
2. Municipal and Panchayat bye-laws
3. CMDA rules
4. Corporation bye-laws
5. Town planning - SC. Rangwala
6. Urban and regional planning – KA. Ramegowda, University of Mysore
7. The urban pattern, city planning and design – M/s DVan
8. Time saver standards for site planning – Mc Graw Hill Book company
9. An Introduction to town and country planning – John Rate life London
10. The art of home land scapping – Mc Graw Hill Book company
11. A Guide to site and Environmental planning – Harvey M. Rubenstein Newyork.

**1063 c - ADVANCED R. C. CONCRETE STRUCTURES**  
(Elective Theory – II)

7 Hours / Week

14 Weeks

98 Hours

**Objective:** Design with the help of Design AIDS to IS 456 – 2000

**Unit 1**

**17 Hours**

Introduction – Limit state method - design AIDS – Referring examples, tables & Charts Design of Singly & Doubly Reinforced rectangular beams. Design of Singly reinforced T- beams. Determination of reinforcement by using design AIDS.

Design of one way slab & two way slabs. Determination of reinforcement by using design AIDS.

Design of Rectangular beams and T-beams for Shear using design AIDS .

**Unit 2**

**16 Hours**

Columns – Short column – Design of columns – Axially loaded & Uniaxial bending – Determination of area of reinforcement using design AIDS.

Column footings – Square & rectangular footings – Design of footings - Determination of reinforcement using design AIDS.

**Unit 3**

**18 Hours**

Yield line theory – Introduction – Yield line pattern for different shapes – Formulas for Design moments – Design of circular & square slabs.

**Unit 4**

**20 Hours**

R.C.C Retaining walls - Retaining walls 'T' shaped – with or without shear key - Retaining walls with level back fill – Design of base slab – stem - curtailment details - Determination of reinforcement using design AIDS

**Unit 5**

**21 Hours**

Water Tanks – Introduction – permissible stresses in steel minimum reinforcement - Minimum cover design of circular tank with flexible base – Design of circular tank with fixed base at base & free at top ( IS code method IS -370 part IV – 1967) Design of rectangular tanks (Length to breadth ratio less than 2).

**Revision & Test**

**6 Hours**

### **Reference Books :**

1. I S 456-2000
2. I S 875
3. SP 16 & SP 24
4. I S 800 -1984
5. Limit state design by Dr. Ramachandra
6. Design of reinforced concrete structures by P. Dayaratnam
7. Concrete structures by Vazirani & Ratwani
8. Design of reinforce concrete structures by Dr. K.T. Krishnasamy
9. Reinforced concrete by N.C.Sinha & S.K. Roy
10. Limit state Design by Karve.
11. Limit state Design by P C Varghese
12. Limit State Design by Syal and Goel
13. Reinforced Cement concrete by Park and Pauley
14. Reinforced Cement concrete by Mallick and Rangasamy
15. Reinforced Cement concrete by Sinha and Roy

## 1064 ENVIRONMENTAL ENGINEERING LAB PRACTICE

3 Hours/Week

14 Weeks

42 Hours

### WATER AND WASTE WATER ANALYSIS

1. Collection of Water Samples from Sources and " Estimation of Residual Chlorine" by Colour Comparison method.
2. Determination of pH value by Electrometric method using pH meter/ Colorimetric method and Comparison by Paper method.
3. Determination of Turbidity of water by "Jackson Candle Turbidity meter".
4. Determination of settleable solids present in the given sample of water/ wastewater by "Imhoff Cone".
5. Determination of Total solids present in the given sample of water/ wastewater.
6. Determination of "Total Hardness" present in the given sample of water by EDTA Titration method.
7. Determination of "Temporary & Permanent Hardness" present in the given sample of water by EDTA Titration method.
8. Estimation of chlorides in the given sample of water by Silver Nitrate Titration method.

### PLUMBING WORKS LAB

9. Study of pipefitting used in water supply (with actual models displayed on board)
10. Study of Sanitary Wares (with actual models displayed on board).
11. Cutting, threading and joining of G.I. pipes/ cutting and pasting of PVC pipes using solvents.
12. Making a bathroom connection from an existing water supply main (making Indents, drawing a neat sketch of the connection with details).
13. Making Suction and Delivery pipe connections to a centrifugal pump (making Indents, drawing a neat sketch of the connection with details).
14. Study of Air Pollution Control Equipments (Gravity Settling Chamber, Cyclone filter with models/ devices).

# 1065 - CONSTRUCTION LAB PRACTICE

6 Hours / Week

14 Weeks

84 Hours

1. Slump test on concrete
2. Compaction factor test on concrete
3. Casting of concrete cube and compression test on concrete cube
4. Fineness modulus of fine and coarse aggregate
5. Bulking characteristics of sand
6. Laying of brick wall corners, T-junction, pillars in English bond
7. Demonstration and practice in painting, varnishing and polishing
8. Cutting, Hooking, cranking and arrangement of reinforcement
  - a. Beam
  - b. Lintel and Sunshade
  - c. Column and footing.
9. Measurement Book – Procedure for entering in measurement book
10. Entering measurement for building works

All the students should enter directly on measurement book and they should keep the entry for the following works independently in the measurement book including schedule rates for the respective work for the current year.

Exercise from existing buildings inside the campus and only single room for each student.

  - a. Measurement and abstract for flooring work
  - b. Measurement and abstract for Brick work
  - c. Measurement and abstract for colour washing
11. Pre – measurement for steel work

The following models should be prepared in the laboratory, students should take out measurement from the model, they should enter the measurement in the measurement book and the total quantity of steel required in kg for each item may be arrived.

  - a. One way slab-size – 2.0 m x 2.0 m
    - Main rod – 8 mm dia. - 15 nos.
    - Distributor – 6 mm dia - 12 nos.
  - b. Column and footing
    - Footing – size – 1.0 m x 1.0 m – 10 mm dia 5 nos. each direction
    - Column – size – 150 mm x 150 mm – 4 nos. 10 mm dia
  - c. Beam – size – 230 mm x 300 mm – Length – 2.0 m
    - Bottom rod – 12 mm – 3 nos.
    - Top rod – 10 mm – 2 nos.
    - Stirrups – 6 mm – 14 nos.

# 1066 – PROJECT WORK

6 Hours/Week

14 Weeks

84 Hours

## LIST OF SUGGESTED PROJECTS

### COMPARITIVE STUDY :

- The properties of different types / brands of Cement available
- Different types of Staircases
- The cost of different types of trusses for different Spans
- The cost and construction procedures of trusses with angles and tubes

### ADMIXTURES :

- Economy of using flyash in concrete

### MIX DESIGN :

- Comparative study of mix design by different methods

### R.C.C. CASTING :

- Demonstration models showing reinforcement details – Comparison of different types of Slab/Beams

### PAPER PROJECTS :

#### PLANNING, DESIGN AND COST ANALYSIS OF

- Residential Houses
- Primary Health Centre
- School Buildings
- Guest House
- Panchayat Union Office Building
- Bank Building
- Post Office Building
- College Building
- Hospital Buildings
- Hotel Buildings
- Hostel Buildings
- Factory Building
- Auditorium
- Way side Railway Station
- Shopping Centre
- Community Hall
- Theatre
- Market Building

- Multistoried Car Park
- Rural Bus Stand
- Stadium
- Swimming Pool
- Over head tank for a village
- New village road with culvert
- Culvert
- Small Bridge
- Plate Girder Bridge
- Septic Tank for a colony

#### SPECIAL TYPES OF CONCRETE CONSTRUCTION

- Bamboo as a reinforcing material
- Ferro cement products – Water tanks, Septic tank

#### PRECAST CONSTRUCTION

- Precasting of R.C.C.Door and window frames
- Precasting of Brick – Concrete beams
- Precasting of different shapes of roof slabs

#### MISCELLANEOUS

- Foundations for light building on expansive soils
- Study of the reduction of swelling behaviour of black cotton soil by stabilization
- Soil cement blocks – relative study

### **Scheme of Examination**

Report Writing	: 30 Marks
Ten short Questions	: 20 Marks
Internal Assessment	: 25 Marks
Viva – Voce	: 25 Marks
Total	: <u>100 Marks</u>

**Note** : External Examiner should prepare suitable common question paper by referring all projects done by the students.

**ALLOCATION OF MARKS / QUESTION / STUDENT**

**A) SURVEYING PRACTICE I, II**

SI.No:	Description	Practice I		Practice II	
		Max. marks		Max. marks	
		40	30	30	25
1.	Procedure, Handling Tools/Instruments	5	5	5	5
2.	Tabular form, Observations.	8	7	7	5
3.	Field works/Calculations & Check/drawings.	22	15	15	13
4.	Accuracy of result	5	3	3	2
5.	Viva-voce	5		5	
6.	Camp file	-		15	
7.	Record	25		25	
	<b>Total (1 to 7)</b>	100		100	

**B) COMPUTER LAB PRACTICE.**

1. CAD in civil Engineering Drawing Practice.
2. Computer application in civil Engineering.

SI.No:	Description	Max. marks for
		1 / 2
		70
1.	Preparation /collection of data/freehand drawing/commands	10
2.	Programming & Execution	25
3.	Output /Work done	25
4.	Finishing	10
5.	Viva-voce	5
6.	Record	25
	<b>Total (1 to 6)</b>	<b>100</b>

**C) FOR ALL OTHER PRACTICAL SUBJECTS.**

<b>Sl.No:</b>	<b>Description</b>	<b>Full question (70)</b>	<b>Part A (40)</b>	<b>Part B (30)</b>
1.	Procedure and handling equipments/tools	<b>10</b>	<b>5</b>	<b>5</b>
2.	Tabular form and observation	<b>15</b>	<b>8</b>	<b>7</b>
3.	Equations, calculations & graph/Drawings	<b>40</b>	<b>22</b>	<b>15</b>
4.	Accuracy of result	<b>5</b>	<b>5</b>	<b>3</b>
5.	Viva-voce	<b>5</b>	<b>5</b>	
6.	Record	<b>25</b>	<b>25</b>	
	<b>Total (1 to 6)</b>	<b>100</b>	<b>100</b>	

**Note:-** Minimum % marks for pass in each practical subjects = **50%**