

## **List of Experiments:**

### **❖ CIVIL ENGINEERING MATERIAL LAB**

1. Identification of Materials by Visual Inspection
2. To determine Normal Consistency, Initial & Final setting time, Specific Gravity, fineness & compressive strength of Cement (IS: 269-1967)
3. To Study the Utilization of Fly Ash
4. To Study the Procedure for Testing of Stone
5. To Study the Fiber Reinforced Concrete
6. To Study the Properties and Use Of Different Glasses
7. To Study the Different Aluminum and Steel Sections
8. To Study the Manufacture and Use of Concrete Hollow Blocks
9. To Determine Compressive and Tensile Strength of Timber Parallel and Perpendicular to Grain
10. To Study the Properties and Uses of Kota Stone
11. To determine the Water Absorption and Tolerance Limit of Bricks

### **❖ ENGINEERING GEOLOGY LAB**

1. Physical Properties of Minerals
2. Physical Properties of Rocks
3. Identification of Minerals in Hand Specimen
4. Identification of Rocks in Hand Specimen
5. Identification of Geological features through wooden Models
  - a) Structural Geological Diagrams
  - b) Petrological Diagrams
  - c) Engineering Geological Diagrams
6. Interpretation of Geological Map (10 Nos.)
7. Dip & Strike Problems (8 Nos.)

### **❖ FLUID MECHANICS LAB**

1. To verify the Bernoulli's theorem.
2. To calibrate the Venturimeter.
3. To calibrate the Orificemeter.
4. To determine Metacentric Height.
5. To determine  $C_c$ ,  $C_v$ ,  $C_d$  of an orifice.

6. To determine Cd of a mouthpiece.
7. To determine Cd of a V-notch.
8. To determine viscosity of a given fluid.
9. Bye Pass.

### ❖ **CONCRETE TECHNOLOGY LAB**

1. To determine the fineness of Cement by sieving through a 90 micron I.S. Sieve.
2. To determine the flexural strength of Concrete.
3. To determine Soundness of cement by Le-chatelier apparatus.
4. To determine the specific gravity of fine aggregate (sand) by Pycnometer.
5. To determine the bulking of fine aggregate and to draw curve between water content and bulking.
6. To determine the fineness modulus of coarse aggregates and fine aggregates by sieve analysis.
7. To determine the workability of given concrete mix by slump test.
8. To determine the workability of given fresh concrete mix by compaction factor test.
9. To determine the optimum dose of super plasticizers by Flow table test.
10. To design concrete mix of M-20 grade without admixture in accordance with I S recommendations.
11. To design concrete mix of M-40 grade with admixture in accordance with I S recommendations.
12. To determine the Elastic Modulus of Concrete.
13. To determine the Permeability of Concrete.
14. NDT

### ❖ **SURVEYING LAB**

1. Ranging and Fixing of Survey Station.
2. Plotting Building Block by offset with the help of cross staff.
3. To determine the magnetic bearing of a line
  - a. Using surveyor's compass
  - b. Using prismatic compass
4. Measurement and adjustment of included angles of traverse using prismatic compass.
5. To determine the reduced levels using Tilting Level/Automatic Level.
6. To determine the reduced levels in closed circuit using Dumpy Level.
7. To carry out profile leveling and plot longitudinal and cross sections for road.
8. To carry out temporary adjustment of Theodolite & Measurement of horizontal angle.

- a. By method of repetition.
- b. By method of Reiteration.
- 9. To determine the tachometric constant.
- 10. To determine the horizontal and vertical distance by tachometric survey.
- 11. To study the various minor instruments.

❖ **HYDRAULICS LAB**

- 1. To determine the minor losses.
- 2. To determine the friction factor.
- 3. To determine Cd of Broad crested wier.
- 4. To verify the momentum equation.
- 5. To determine the discharge of venturimeter.
- 6. To determine Manning's & Chezy's coefficient of roughness for the bed of a given flume.
- 7. To plot characteristics curve of hydraulic jump.
- 8. To plot characteristics curve of Pelton Wheel.
- 9. To plot characteristics curve of Centrifugal Pump.

❖ **BUILDING DRAWING LAB**

1- To plan and draw working drawing of a Residential building with following detail.

- (a) Site plan
- (b) Foundation plan
- (c) Plan
- (d) Two sectional elevations
- (e) Front elevation
- (f) Furniture plan
- (g) Water supply and sanitary plan
- (h) Electric fitting plan

2- To design and draw a Primary Health Center

3- To design and draw a Primary School

4- To design and draw a Rest House

5- To design and draw a Post Office

6- To design and draw a Bank

7- To design and draw a College Library

### ❖ **MATERIAL TESTING LAB**

1. Tensile Strength Test – Mild Steel and HYSD bar
2. Compressive Strength Test – Mild Steel and Cast Iron
3. Compressive Strength Test – Cement Cubes and Concrete Cubes
4. Compressive Strength Test – Bricks
5. Compressive Strength Test – Wooden Blocks
6. Hardness Test – Rockwell Hardness and Brinell Hardness
7. Impact Test – Izod and Charpy
8. Modulus of Rupture of Wooden Beam
9. Fatigue Test
10. Spring Test
11. Torsion Test

### ❖ **ENVIRONMENTAL ENGINEERING DESIGN & Lab. -I**

1. To determine the pH of the given sample of water.
2. To determine the turbidity of the given sample of water
3. To determine Total Solids of the given water sample.
4. To determine the Total Dissolved Solids of the given water sample.
5. To find out conductivity of the given water sample.
6. To determine hardness of the given water sample.
7. To find out chloride of the given water sample.
8. To determine alkalinity of the given water sample.
9. To find out acidity of the given water sample.
10. To determine hardness of the given water sample.
11. To determine the optimum dose of alum by Jar test.
12. To study various water supply Fittings.

### ❖ **GEOTECHNICAL ENGG.-I LABORATORY**

1. Grain size distribution by Sieve Analysis
2. Determination of water content by Pycnometer.
3. Determination of specific Gravity by Pycnometer.
4. Determination of liquid limit by Casagrande's apparatus.
5. Determination of liquid limit by cone penetrometer.

6. Determination of plastic limit
7. Determination of shrinkage limit
8. Determination of field density by core-cutter
9. Determination of field density by sand replacement method
10. Determination of compaction properties by standard Proctor Test Apparatus
11. Determination of  $C-\phi$  values by Direct Shear Test Apparatus
12. Determination of Unconfined Compressive Strength by unconfined compression Test Apparatus

❖ **SURVEYING LAB. -II**

1. To measure the horizontal and vertical angles by Theodolite.
2. To determine the Height of an object by trigonometric leveling (Instruments in same vertical plane).
3. To determine the Height of an object by trigonometric leveling (Instruments in different vertical planes).
4. To shift the R.L. of known point by double leveling.
5. To measure and adjust the angles of a braced quadrilateral.
6. To prepare a contour map by indirect contouring.
7. To prepare the map of given area by plane tabling.
8. To determine the Azimuth of a given line by ex-meridian observations of Sun.
9. Survey Camp (including exercise on triangulation, topographic, or project survey) with maximum duration of 10 days.

❖ **STRUCTURAL ENGINEERING LAB**

1. Deflection of a truss
2. Clark-Maxwell reciprocal theorem with truss
3. Funicular polygon for flexible cable
4. Analysis of redundant frame
5. Deflection of curved members
6. Buckling of columns
7. Clark-Maxwell reciprocal theorem with simply supported beam
8. ILD for deflection in a steel beam using unit load method
9. ILD for support reaction using Muller-Breslau Principle
10. Unsymmetrical bending.
11. Two hinged and three hinged arches.

## ❖ **GEOTECHNICAL ENGG. DESIGN AND LABORATORY. – II**

1. To determine the differential free swell index of soil.
2. To determine the grain size distribution of fine grained soil by Hydrometer.
3. To determine the CBR of soil.
4. To determine the compressibility parameters of soil by consolidation test.
5. To determine the swelling pressure of soil.
6. To determine the permeability of soil by constant and falling head methods.
7. To determine the shear strength parameters of soil by tri-axial test.
8. Design problems based different units of theory syllabus.

## ❖ **ENVIRONMENTAL ENGINEERING LAB. & DESIGN – II**

1. To determine the pH of the given sample of sewage.
2. To determine Total Solids of the given sewage sample.
3. To determine the Total Dissolved Solids of the given sewage sample.
4. To find out Total Settle-able Solids of the given sewage sample.
5. To determine Total Suspended Solids of the given sewage sample.
6. To find out the Quantity of Dissolved Oxygen present in the given water sample by Winkler's Method.
7. To determine Biochemical Oxygen Demand exerted by the given wastewater sample.
8. To find out Chemical Oxygen Demand of the waste water sample.
9. To study various Sanitary Fittings.

## ❖ **ROAD MATERIAL TESTING LAB**

1. Aggregate Impact test
2. To determine the flakiness index & Angularity number test of given sample of aggregate.
3. To determine fineness modulus of a given sample of coarse aggregate.
4. Los angles abrasion test
5. Aggregate crushing value test
6. Specific gravity and water absorption test of aggregate.
7. Standard tar viscometer test
8. To determine the elongation index for given sample of aggregate.
9. Ductility test
10. To determine the softening point for give sample of bitumen.

11. Marshall stability test

12. Float test

❖ **DESIGN of FOUNDATIONS LAB**

1. Design of isolated shallow footings, combined footings, raft foundations.

2. Design of pile foundations.

3. Design of wells and cassions.

4. Design of machine foundation.

5. Design of retaining structures etc.