Vocational Curriculum – 2012

(With effect from the academic year 2012-2013)

Curriculum of Intermediate Vocational Course

In

CONSTRUCTION TECHNOLOGY

State Institute of Vocational Education
O/o the Commissioner of Intermediate Education,
Andhra Pradesh, Hyderabad

&

Board of Intermediate Education,
Andhra Pradesh, Hyderabad
Contents

I. Introduction
II. Objectives of the Course
III. Skills to be provided
IV. Job Opportunities
   a. Wage Employment
   b. Self Employment
V. Scheme of Instruction & Examinations
VI. Syllabus
   a. Theory
   b. Practicals
VII. List of equipment
VIII. a. Collaborating Institutions for curriculum transaction.
      b. On the Job Training centers
IX. Qualification for Lecturers
X. Vertical Mobility
   a. With Bridge Course
   b. Without Bridge Course.
XI. Reference Books
XII. Model Question papers.
XIII. List of subject Committee Members.
INTRODUCTION

The construction industry is playing a vital role in development of skilled people like Engineers, Architects who are available at designing and supervisory level. In general the construction worker does not have knowledge and skills. To improve quality in the work, to minimize the wastage of material and also to control the cost of construction, it becomes necessary to train the workers.

The course “Construction Technology” will be more useful to students to develop their career in construction industry. The course is designed to suit the construction industry requirement. The course is divided into two parts. Part one is core syllabus in which the students are given basic academic knowledge, part two is specialization in which the students are trained in particular areas of construction technology.

OBJECTIVES OF THE COURSE

To train the students in various techniques in the construction of buildings and survey field, especially cost efficient techniques to develop competencies in assisting supervisors, engineers and contractors and prepare themselves for self employment.

SKILLS TO BE PROVIDED

1. Skills to prepare plans and estimate the cost of project.
2. Skills in testing and choosing good quality building materials
3. Skills are constructions of different items like, foundations, masonry works, columns beams slabs and finishing works.
4. Skills to provide water supply and sanitary, electrical installations and fittings in the buildings.
5. Skills maintenance of buildings and constructions repairs.
7. Preparation of building drawings in Auto cad.
8. Skills in Highways.
JOB OPPORTUNITIES

a) Wage employment:
   1. Work as mason, carpenter, painter etc in construction industry.
   2. Assistants under engineers and architects.
   3. Contract jobs under contractors.

b) Self employment:
   1. As a contractor for supplying of building materials
   2. Execution of specialization works like painting, bar bending etc.
   3. Execution of small works in Government Organizations as contractors.
V. SCHEME OF INSTRUCTION AND EXAMINATION
5.1 ANNUAL SCHEME OF INSTRUCTION AND EXAMINATION FOR 1ST YEAR CONSTRUCTION TECHNOLOGY COURSE

<table>
<thead>
<tr>
<th>Part-A</th>
<th>Theory</th>
<th>Pricals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Periods</td>
<td>Marks</td>
<td>Periods</td>
</tr>
<tr>
<td>1.</td>
<td>150</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td>2.</td>
<td>150</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part-B**

<table>
<thead>
<tr>
<th></th>
<th>Theory</th>
<th>Pricals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Periods</td>
<td>Marks</td>
<td>Periods</td>
</tr>
<tr>
<td>3.</td>
<td>135</td>
<td>50</td>
<td>135</td>
</tr>
<tr>
<td>4.</td>
<td>135</td>
<td>50</td>
<td>135</td>
</tr>
<tr>
<td>5.</td>
<td>135</td>
<td>50</td>
<td>135</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td>365</td>
</tr>
<tr>
<td>7.</td>
<td>705</td>
<td>250</td>
<td>770</td>
</tr>
</tbody>
</table>

| On the Job Training November and December |
| Construction Technology II year |

<table>
<thead>
<tr>
<th>Part-A</th>
<th>Theory</th>
<th>Pricals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Periods</td>
<td>Marks</td>
<td>Periods</td>
</tr>
<tr>
<td>1.</td>
<td>150</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td>2.</td>
<td>150</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part-B**

<table>
<thead>
<tr>
<th></th>
<th>Theory</th>
<th>Pricals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Periods</td>
<td>Marks</td>
<td>Periods</td>
</tr>
<tr>
<td>3.</td>
<td>110</td>
<td>50</td>
<td>115</td>
</tr>
<tr>
<td>4.</td>
<td>110</td>
<td>50</td>
<td>115</td>
</tr>
<tr>
<td>5.</td>
<td>110</td>
<td>50</td>
<td>115</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td>450</td>
</tr>
<tr>
<td>7.</td>
<td>630</td>
<td>250</td>
<td>795</td>
</tr>
</tbody>
</table>

| I+II+III | 1000 |

On the Job Training : August, September & October
EVALUATION OF ON THE JOB TRAINING:

The “On the Job Training” shall carry 100 marks for each year and pass marks is 50. During on the job training the candidate shall put in a minimum of 90% of attendance.

The evaluation shall be done in the last week of January.

Marks allotted for evaluation:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the activity</th>
<th>Max. Marks allotted for each activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Attendance and punctuality</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Familiarity with technical terms</td>
<td>05</td>
</tr>
<tr>
<td>3</td>
<td>Familiarity with tools and material</td>
<td>05</td>
</tr>
<tr>
<td>4</td>
<td>Manual skills</td>
<td>05</td>
</tr>
<tr>
<td>5</td>
<td>Application of knowledge</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Problem solving skills</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Comprehension and observation</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Human relations</td>
<td>05</td>
</tr>
<tr>
<td>9</td>
<td>Ability to communicate</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>Maintenance of dairy</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

NOTE: The On the Job Training mentioned is tentative. The spirit of On the Job training is to be maintained. The colleges are at liberty to conduct on the job training according to their local feasibility of institutions & industries. They may conduct the entire on the job training periods of (363) I year and (450) II year either by conducting classes in morning session and send the students for OJT in afternoon session or two days in week or weekly or monthly or by any mode which is feasible for both the college and the institution. However, the total assigned periods for on the job training should be completed. The institutions are at liberty to conduct On the Job training during summer also, however there will not be any financial commitment to the department.
**SCHEME OF INSTRUCTION PER WEEK**

<table>
<thead>
<tr>
<th>Part-A</th>
<th>Theory</th>
<th>Practicals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. English</td>
<td>4</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>2. G.F.C.</td>
<td>4</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td><strong>Part-B</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vocational Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper-I</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Paper-II</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Paper-III</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20</td>
<td>12</td>
<td>32</td>
</tr>
</tbody>
</table>
## TIME SCHEDULE

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>TOPICS</th>
<th>NO. OF PERIODS</th>
<th>WEIGHTAGE OF MARKS</th>
<th>NO. OF SHORT QUESTIONS</th>
<th>NO. OF ESSAY QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Stones</td>
<td>4</td>
<td>6</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Bricks</td>
<td>14</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Clay Products</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Lime</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Cement</td>
<td>20</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Sand</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Mortar</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Concrete</td>
<td>20</td>
<td>12</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Timber</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Metals</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Surface Protective Materials</td>
<td>14</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Miscellaneous Materials</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>135</strong></td>
<td><strong>68</strong></td>
<td><strong>10</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

### OBJECTIVES:

The Student understands the varieties of materials, availability of materials, and Suitability of particular materials for particular construction activity.

Note: After completion of every Unit one/two assignments will be given to the students.
Detailed Syllabus:

1. Introduction
   1.1. General
   1.2. Scope and purpose of the subject

2. Stones
   2.1. Introduction
   2.2. Classification of Rocks
       2.2.1. Geological classification
       2.2.2. Physical classification
   2.3. Common varieties of stones – their uses
   2.4. Availability of important stones
   2.5. Dressing of stones
   2.6. Different types of surface finishes
   2.7. Introduction of aggregates – grading of aggregates

3. Bricks
   3.1. Composition of good brick earth
   3.2. Requirements of good brick earth
   3.3. Manufacture of Bricks
       3.3.1. Preparation of brick earth
       3.3.2. Moulding
       3.3.3. Drying
       3.3.4. Burning
   3.4. Field tests of good bricks
   3.5. Characteristics of good bricks
   3.6. Classification of Bricks as per I.S.
   3.7. I.S.I. Specification for bricks
   3.8. Special Forms of Bricks
   3.9. Special purpose Bricks
       3.9.1. Cement bricks, Uses and advantages
       3.9.2. Fly ash bricks, uses and advantages

4. Clay Products
   4.1. Tiles – Types of Tiles
   4.2. Roofing Tiles
   4.3. Flooring Tiles
   4.4. Stone ware pipes
   4.5. Glazing
   4.6. Porcelain
   4.7. Terra- cotta

5. Lime
   5.1. Introduction
   5.2. Lime - properties and uses
   5.3. Sources of lime
   5.4. Calcinations of lime
   5.5. Slaking of lime
   5.6. Quick lime
   5.7. Classification of lime
5. Cement

6.1. Introduction
6.2. Chemical composition of Portland cement
6.3. Manufacture of ordinary Portland cement
   6.3.1. Dry Process
   6.3.2. Wet Process
6.4. Field tests of cement
6.5. Tests for cement as per I.S.I.
   6.5.1. Fineness test by sieving
   6.5.2. Consistency test
   6.5.3. Initial and Final setting times test
   6.5.4. Compressive strength test
6.6. Types of cement
   6.6.1. Grades of Cement
   6.6.2. Ordinary Portland cement (O.P.C)
   6.6.2. Quick Setting Cement
   6.6.3. Rapid hardening cement
   6.6.4. White cement
   6.6.5. P.P.C.

7. Sand
   7.1. Sources of sand
   7.2. Natural sand
   7.3. Robo sand
   7.4. Characteristics of good sand
   7.5. Grading of sand
   7.6. Bulking of sand

8. Mortars
   8.1. General
   8.2. Classification of Mortars
   8.3. Different proportions of mortars for various construction works
   8.4. Precautions in use of Mortars.

9. Concrete
   9.1. Definition, purpose of concrete
   9.2. Types of concrete
   9.3. Ingredients of plain concrete
   9.4. Proportions and uses of different grades of concrete.
   9.5. Re-inforced cement concrete
   9.6. Pre-cast concrete
   9.7. Water - cement ratio
   9.8. Mixing of concrete - methods
   9.9. Batching of concrete
   9.10. Transporting of concrete - methods
   9.11. Placing of concrete
      9.12.1. Types of vibrators
   9.13. Curing of Concrete - methods
10. Timber
10.1. Introduction
10.2. Defects in timber
10.3. Common varieties of timber in A.P.
10.4. Wood Products
10.5. Characteristics of good timber

11. Metals
11.1. Types of metals
11.2. Properties, chemical composition and uses of cast iron
11.3. Properties, chemical composition and uses of wrought iron
11.4. Properties and uses of steel.
11.5. Commonly used structural steel sections
11.6. Re-inforcing steel – types, chemical composition
11.7. Weights of tor steel per meter length of rods of various diameters
11.8. Tests on Metals

12. Surface Protective Materials
12.1. Introduction
12.2. Paints and Types of paints
12.3. Functions of paints
12.4. Ingredients of paint
12.5. Characteristics of good paint
12.6. Varnishes
   12.6.1. Ingredients of varnish
   12.6.2. Types of varnishes
12.7. French Polish

13. Miscellaneous Material
13.1. Glass
13.2. Adhesives
13.3. Asbestos
13.4. Thermocole
13.5. Plaster of Paris
13.6. Fibre Reinforced concrete
13.7. Wall Paper
13.8. P.V.C.
13.9. Bitumen and Tar
13.10. Aluminium

Note: Latest developments on this subject should be followed from time to time.
CONSTRUCTION TECHNOLOGY COURSE

CONSTRUCTION TECHNOLOGY

SURVEYING THEORY (THEORY)

1 YEAR PAPER - II
(COMMON TO C.T, BC&MT)

Periods / Week: 4

TIME SCHEDULE

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>TOPICS</th>
<th>NO.OF PERIODS</th>
<th>WEIGHTAGE OF MARKS</th>
<th>NO. OF SHORT QUESTIONS</th>
<th>NO.OF ESSAY QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>15</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Chain Surveying</td>
<td>30</td>
<td>14</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Compass Surveying</td>
<td>25</td>
<td>16</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Levelling</td>
<td>25</td>
<td>16</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Theodolite Surveying</td>
<td>20</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Total Station and Distomat</td>
<td>20</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>135</td>
<td>68</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

NOTE: Calculators are permitted for Examinations.

OBJECTIVES:

The Student understands all the terminology in Civil Engineering branches i.e. Chain / Tape Surveying, Compass Surveying, Leveling, Theodolite, Total Station, and Distomat. The application of different instruments and advantages one over the other.
Detailed Syllabus:

1. Introduction:
   1.1. Concept of surveying
   1.2. Purpose of surveying
   1.3. Linear and angular measurements
   1.4. Classification of surveying:
      1.4.1. Plane and geodetic surveying
      1.4.2. Classification based on instruments
      1.4.3. Engineering surveys
   1.5. Reconnaissance, preliminary location survey, final location survey.

2. Chain Surveying
   2.1. Purpose and principle of chain survey
   2.2. Equipments used and their function - chains, arrows, tapes - ranging rods - plumb bob - cross staff
   2.3. Conventional signs.
   2.4. Errors in chaining –
   2.5. Corrections due to incorrect length of chain or tape.
   2.6. Types of survey lines
   2.6.1. Base line
   2.6.2. Tie line
   2.6.3. Check line
   2.7. Fixing of survey stations
   2.8. Types of survey stations.
   2.9. Different operations in chain surveying - chaining – ranging setting out right angles chaining on sloped ground.
   2.10. Principles used in chain triangulation.
   2.11. Recording field notes - field book - conventional signs.
   2.13. Calculation of Areas - Average Ordinate, Simpson, Trapezoidal methods.

3. Compass Surveying
   3.1. Purpose and Principle of compass survey - description, use and working of prismatic compass.
   3.2. Concept of true meridian - magnetic meridian – Arbitrary meridian.
   3.3. Bearing - Representation of Bearing WCB, Quadrantal Bearing. Conversion of whole circle bearing to quadrantal bearing and vice versa.
   3.4. Compass traversing in field.
   3.5. Local attraction - detecting and correcting bearings.
   3.6. Calculation of included angles in compass traverse.
   3.7. Errors in compass surveying - natural and instrumental.

4. Levelling
   4.1. Purpose of Levelling - Definition of terms, level surface, datum bench marks, types of bench marks.
   4.2. Types of levelling instruments - dumpy level - component parts. - relationship between fundamental lines of instrument.
   4.3. Types of Levelling staves - description.
   4.4. Temporary adjustments of dumpy level.
5. Theodolite Surveying

5.1. Principles of Theodolite Surveying - component parts, technical terms - temporary adjustments
5.2. Measurement of Horizontal angles by repetition method and reiteration method, vertical angle.
5.3. Determination of heights and distances.

6. Total Station & Distomat

6.1. Total Station - Parts and the functions - Adjustments of total station for taking observations.
6.2. Measurement of Horizontal Distance, Slope distance, Difference in Height between two points.
6.3. Elevation of a Point.
6.4. Horizontal angle and distance between two stations.
6.5. Setting out right angles at different points on a base line.
6.6. Setting out plan of a building on the ground.
6.7. Prolonging a straight line.
6.9. Earth work calculation.
6.10. Distomats
   6.10.1. Distomat DI 1000.

Note: Latest developments and modern techniques on this subject should be followed from time to time.
CONSTRUCTION TECHNOLOGY
ENGINEERING MECHANICS (THEORY)
I YEAR PAPER-III
(COMMON TO C.T, BC & MT)

Periods / Week: 4

Periods/ Year: 135

TIME SCHEDULE

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>TOPICS</th>
<th>NO.OF PERIODS</th>
<th>WEIGHTAGE OF MARKS</th>
<th>NO. OF SHORT QUESTIONS</th>
<th>NO.OF ESSAY QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Systems of Measurements and Units</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Forces and Moments</td>
<td>23</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Centroid and Moment of Inertia</td>
<td>22</td>
<td>14</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Simple stresses and strains</td>
<td>25</td>
<td>16</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Columns</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Shear Force and Bending Moment</td>
<td>32</td>
<td>16</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Graphic Statics</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>135</td>
<td>68</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

NOTE: Calculators are permitted for Examinations.
Detailed Syllabus:

1.0. Systems of Measurements and Units
   1.1. S.I. and M.K.S. System
   1.2. F.P.S. System
   1.3. Fundamental and Derived units
   1.4. Units of Physical quantities used in Civil Engineering like length, area, volume, mass, force etc.

2.0. Forces and Moments
   2.1. Definition of Force, Moment, Resultant, Equilibrant and Moment of a couple
   2.2. Resultant of forces at a point, parallelogram law, Triangle law of forces, polygon law of forces
   2.3. Distinguish between scalar and vector quantities, co-planar and non-co-planar forces, parallel and non-parallel forces, like and unlike forces
   2.4. Conditions of Equilibrium of rigid bodies

3.0. Centroid and Moment of Inertia
   3.1. Definition - Centroid, First moment of area, moment of inertia, Radius of gyration
   3.2. Position of centroid of Rectangle, triangle, circle, semi circle.
   3.3. Determine position of centroids of simple built up sections made of rectangle, triangle, circle, semi-circle.
   3.4. Determine M.I. of simple and built-up sections, perpendicular axis theorem and parallel axis theorem
   3.5. Radius of gyration, polar M.I. of solid and hollow circular sections

4.0. Simple stresses and strains
   4.1. Stress and strain - tensile, compressive and shear
   4.2. Mechanical properties of materials - elasticity, plasticity, ductility, brittleness, malleability, stiffness, hardness, fatigue
   4.4. Hooke's Law - Young’s modulus of elasticity, deformation under axial load
   4.5. Longitudinal and lateral strain - poisson’s ratio - Bulk modulus, relationship between elastic constants. (proof not required)

5.0. Columns
   5.1. Effective Lengths for different end conditions.
   5.2. Columns – Long and Short Columns – Comparison.
   5.3. Slenderness ratio of a column – Rectangular, Square, I, Circular Sections.
   5.4. Load carrying capacity by Euler’s and Rankine’s Formulae - Simple Problems.

6.0. Shear Force and Bending Moment
   6.1. Types of beams - cantilevers, simply supported, over hanging - fixed and continuous beams
   6.2. Calculation of S.F. and B.M. values at different sections for cantilevers, simply supported beams, over hanging beams under point loads and uniformly distributed loads - position and significance of points of contraflexure
   6.3. Relation between rate of loading, S.F. and B.M. - drawing S.F. and B.M. diagrams - Location of points of contraflexure

7.0. Graphic Statics
   7.1. Representation of forces graphically, bows notation
   7.2. Parallelogram law of forces, resultant and equilibrants
   7.3. Graphical Method of determination of centre of gravity for I, L, T Sections
   7.4. Drawing SFD and BMD by graphical method for SSB and cantilever beams

Note: Latest developments on this subject should be noted from time to time
### Time Schedule

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Major Topics</th>
<th>No. of Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identification of Construction Materials and their application</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Tests on Bricks</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Tests on Cement</td>
<td>15</td>
</tr>
<tr>
<td>4.</td>
<td>Tests on aggregate</td>
<td>15</td>
</tr>
<tr>
<td>5.</td>
<td>Field work on Materials</td>
<td>30</td>
</tr>
<tr>
<td>6.</td>
<td>Test on Concrete</td>
<td>15</td>
</tr>
<tr>
<td>7.</td>
<td>Study of Manufacturing/ Preparation of Construction material at Site/Factory</td>
<td>30</td>
</tr>
</tbody>
</table>

**Total** 135

### Scheme of Valuation:

<table>
<thead>
<tr>
<th></th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>20</td>
</tr>
<tr>
<td>Presentation</td>
<td>10</td>
</tr>
<tr>
<td>Viva</td>
<td>10</td>
</tr>
<tr>
<td>Record</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

**Periods / Week:** 4  
**Periods / Year:** 135
Detailed Syllabus:

1.0. Identification of various construction materials and their applications
   1.1. Identification of various types of stones and their application in construction works
      a) Granite
      b) Sand Stone
      c) Marble
      d) Lime Stone
      e) Slate
      f) Basalt
   1.2. Identification of various types of Bricks and Clay products and their application in construction works
      a) Country Bricks
      b) Special purpose bricks
      c) Earthen ware
      d) Stone ware
      e) Tiles
   1.3. Identification of various types of Metals and their application in construction works
      a) Cast Iron
      b) Wrought Iron
      c) Steel
      d) Aluminium
      e) Copper
      f) Lead
   1.4. Identification of various types of Timber and Wood Products and their application
      a) Teak
      b) Sal wood
      c) Neem
      d) Babul
      e) Veneers
      f) Plywood
      g) Laminate and other boards
   1.5. Identification of Other Miscellaneous Material and their application
      a) Glass
      b) Bitumen
      c) Asbestos
      d) Plastics
      e) Thermocol
      f) Rubber
      g) Linoleum

2.0. Test on Bricks
   2.1. Field tests on bricks
   2.2. Water absorption test on bricks
   2.3. Crushing strength of bricks

3.0. Tests on Cement
   3.1. Field tests of Cement
   3.2. Fineness of Cement
   3.3. Normal Consistency test
   3.4. Initial and Final setting times of cement
4.0. Tests on Aggregate
   4.1. Bulking of sand
   4.2. Standard proctor Compaction test on soils
   4.3. Percentage of voids in coarse aggregate
   4.4. Percentage of voids in fine aggregate
   4.5. Fineness Modulus of coarse aggregate by sieve analysis
   4.6. Fineness Modulus of fine aggregate by sieve analysis

5.0. Field work on Materials
   5.1. Selection of Materials – Cement – Sand – Brick- Marble – Hardware – Electrical Materials used in buildings -
   5.2. Selection of Materials – Sanitary-ware
   5.3. Selection of Materials – Tiles work in building
      5.3.1. Flooring Tiles
      5.3.2. Granite Tiles
      5.3.3. Ceramic Tiles
      5.3.4. Vitrified Tiles
      5.3.5. Market Rates for all the above materials.

6.0. Tests on Concrete
   6.1. Preparation of cement mortar for given proportion
   6.2. Workability test on concrete - slump test
   6.3. Casting of cement concrete cubes and testing for compressive strength

7.0. Study of Manufacturing/ Preparation of construction Materials.
   7.1. Observation of manufacturing of different types of bricks in factory
   7.2. Observation of manufacturing of different types of Tiles and Clay products in Factory
   7.3. Observation of manufacturing of cement in factory
   7.4. Observation of manufacturing of pre-cast concrete members in factory
   7.5. Observation of concrete mixing methods - Hand mixing and machine mixing at site
   7.6. Observation of compaction methods of concrete by tamping and by using vibrators at site

Note : Latest developments on this subject should be followed from time to time
CONSTRUCTION TECHNOLOGY SURVEYING PRACTICE (PRACTICAL)
I YEAR PAPER-II
(COMMON TO C.T, BC & MT)

TIME SCHEDULE:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Major Topics</th>
<th>No. of Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chain Surveying</td>
<td>20</td>
</tr>
<tr>
<td>2.</td>
<td>Compass Surveying</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Levelling</td>
<td>30</td>
</tr>
<tr>
<td>4.</td>
<td>Theodolite Surveying</td>
<td>25</td>
</tr>
<tr>
<td>5.</td>
<td>Total Station and Distomat</td>
<td>25</td>
</tr>
<tr>
<td>6.</td>
<td>Plotting</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>135</strong></td>
</tr>
</tbody>
</table>

Scheme of Valuation:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>20</td>
</tr>
<tr>
<td>Presentation</td>
<td>10</td>
</tr>
<tr>
<td>Viva</td>
<td>10</td>
</tr>
<tr>
<td>Record</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

NOTE: Calculators are permitted for Examinations.
Detailed Syllabus:

1.0. Chain Surveying
1.1. Familiarity with instruments used in chain surveying
1.2. Practicing unfolding and folding of chain
1.3. Ranging and chaining of lines with offsets to objects and recording in field book
1.4. Setting out right angles, by 3,4,5 method
1.5. Chaining a line involving indirect ranging.
1.6. Measure of land area / chain triangulation and cross staff methods
1.7. Chain triangulation around a building covering a small area with other details, taking offsets and recording in the field book.
1.8. To prepare a layout of the given area covering buildings roads etc.
1.9. Marking of a residential building columns in both F.P.S. and M.K.S. System, for a giving building plan.

2.0. Compass Surveying
2.1. Familiarity with Instruments used in compass surveying - prismatic compass
2.2. Setting up the compass - observation of bearings
2.3. Traversing with prismatic compass and chain - calculation of included angles and check.
2.4. Traversing with prismatic compass and chain - closed traverse covering the given area and recording
2.5. Traversing with prismatic compass and chain - open traverse and recording

3.0. Levelling
3.1. Study of dumpy level, levelling staff
3.2. Temporary adjustments of dumpy level
3.3. Taking out levels of various points and booking in a level field book
3.4. Differential or fly levelling - reduce levels by H.I. method and rise and fall method
3.5. Differential levelling involving invert levels - Reduction by H.I. and Rise and fall methods

4.0. Theodolite Surveying
4.1. Study of Theodolite
4.2. Measure of Horizontal angle between given lines
4.3. Measurement of vertical angle
4.4. Determining distance between two inaccessible points by measuring horizontal angle
4.5. Determining height of an object by measuring vertical angle

5.0. Total Station & Distomat
5.1. Total Station - Parts and the functions- Adjustments of total station for taking observations.
5.2. Measurement of Horizontal Distance, Slope distance, Difference in Height between two points.
5.3. Elevation of a Point.
5.4. Horizontal angle and distance between two stations.
5.5. Setting out right angles at different points on a base line.
5.6. Setting out plan of a building on the ground.
5.7. Prolonging a straight line.
5.8. Area of a closed Traverse.
5.9. Earth work calculation.
5.10. Distomats
5.10.1. Distomat DI 1000.

6.0. Plotting
6.1. Conventional signs in surveying
6.2. Perpendicular and oblique offsets
6.3. Plotting of land survey - chain and cross staff surveying -calculation of areas
6.4. Plotting of chain triangulation of small areas around building
6.5. Plotting of closed traverse by compass surveying - location of details
6.6. Plotting of open traverse by compass surveys - location of details

Note: Latest developments and modern techniques on this subject should be noted from time to time.
CONSTRUCTION TECHNOLOGY COURSE

CONSTRUCTION TECHNOLOGY
ENGINEERING DRAWING (PRACTICAL)
1 YEAR PAPER - III

PERIODS / WEEK : 4
PERIODS / YEAR : 135

TIME SCHEDULE

<table>
<thead>
<tr>
<th>SL.NO.</th>
<th>TOPICS</th>
<th>NO. OF PERIODS</th>
<th>WEIGHTAGE OF MARKS</th>
<th>NO. OF SHORT QUESTIONS</th>
<th>NO. OF ESSAY QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Lettering and Dimensioning</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Geometrical Construction</td>
<td>20</td>
<td>10</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Orthographic Projection</td>
<td>25</td>
<td>10</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Isometric Projection</td>
<td>25</td>
<td>12</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>R.C.C. Drawing</td>
<td>25</td>
<td>12</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Fundamentals of Computer</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>M.S. Office</td>
<td>15</td>
<td>12</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>135</strong></td>
<td><strong>60</strong></td>
<td><strong>5</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>

Scheme of Valuation:

Part A: 5 Questions. Each question carries 2 Marks  $5 \times 2 = 10$ Marks

Part B: 5 Questions. Answer any Three questions. Each question carries 10 Marks  $3 \times 10 = 30$ Marks

Part C: Submission of Drawing Sheets and Record  10 Marks

Total  =  50 Marks
Detailed Syllabus

1.0. Introduction
1.1. Scope and objective of the subject
1.2. Importance of engineering drawing as a communication medium
1.3. Drawing instruments and their uses
1.4. Scales: Recommended scales, reduced & enlarged
1.5. Construction of Plain, Diagonal, Vernier Scales, Scale of Chords and Proportional Scales.
1.6. Sheet sizes: A0, A1, A2, A3, A4, A5. Layout of drawing sheet sizes of title block and its contents
1.7. Simple exercises on the use of drawing instruments.

2.0. Lettering and Dimensioning
2.1. Types of Lettering
2.2. Guide Lines for lettering
2.3. Recommended sizes of letters and numbers
2.4. Single stroke letters.
2.5. Dimensioning - rules and systems of dimensioning – dimensioning a given drawing

3.0 Geometrical Construction
3.1. Bisecting a line - perpendiculars - parallel lines - division of a line
3.2. Angles - bisection, trisection
3.3. Tangent lines touching circles internally and externally
3.4. Polygons - Regular polygons - circumscribed and inscribed in circles.
3.5. Conic sections - Definitions of focus, directrix, eccentricity
   (i) Construction of Ellipse by Concentric circles method.
   (ii) Construction of parabola by rectangular method.
   (iii) Construction of Hyperbola when given the position of point from X-axis and Y-axis.

4.0 Orthographic Projection
4.1. Definition - Planes of Projection - Four quadrants - Reference line.
4.2. First angle projection - Third angle projection
4.3. Projections of points
4.4. Projections of straight lines
4.5. Projections of planes
4.6. Projections of solids
4.7. Neat Sketches of only 3 views for describing object
4.8. Concept of Front view, Top view, and Side view, sketching of these views for a number of engineering objects.

5.0. Isometric Projection
5.1. Definition - Isometric axes, lines and planes
5.2. Isometric Scale - Isometric view
5.3. Drawing of isometric views of plane figures
5.4. Drawing of isometric views of prisms and pyramids
5.5. Drawing of isometric view of cylinders and cones

6.0. R.C.C. Drawing
6.1. Draw the Longitudinal section and cross section of singly reinforced of simply supported beam.
   6.1.1. Prepare schedule of reinforcement and quantity of steel.
6.2. Draw the longitudinal and cross section of lintel cum sunshade.
   6.2.1. Prepare schedule of reinforcement and quantity of steel
6.3. Draw the plan and longitudinal section of one-way slab, showing reinforcement details.
   6.3.1. Prepare schedule of reinforcement and quantity of steel.
6.4. Draw the details of Two-way simply supported slab.
7.0. Fundamentals of Computers

7.1. Introduction of Computers


7.2. Basic computer Architecture - Input Output devices - Different peripherals of Computer.

7.3. Memories and Storage Media

7.4. Types of Software - Types of Languages – Operating Systems

7.4.1. MS-Windows

7.4.1.1. Elements of Windows – XP- My Computer, My Documents, Internet Explorer, Network Neighborhood, Recycle Bin etc.

7.4.1.2. Start Menu – Programs Menu – Documents Menu – Find and Help Menu

7.4.1.3. Creating and Editing Text files – Deleting and Restoring files and folders


7.4.1.5. Printing from Windows

8.0. MS-OFFICE

8.1. MS-WORD:

8.1.1. Creating, Opening and Modifying Documents

8.1.2. Practice on changing page layout, setting of tab stops, Text block operations

8.1.3. Practice on Formatting Text - Customizing paragraph formats - changing font styles and size - working with tables and printing documents

8.2. MS-Excel

8.2.1. Working with Excel Work Sheet - Formatting - entering Formulae - Inserting Rows and Columns

8.2.2. Practice on Range and Series - Moving and copying cell contents - creating summary reports

8.2.3. Formatting work sheets - Linking Work Sheets - Working with Graphic Data.

Note: Latest developments and modern techniques on this subject should be followed from time to time.
## TIME SCHEDULE

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>TOPICS</th>
<th>NO. OF PERIODS</th>
<th>WEIGHTAGE OF MARKS</th>
<th>NO. OF SHORT QUESTIONS</th>
<th>NO. OF ESSAY QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>5</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Foundations</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Masonry work (a) Stone Masonry (b) Brick Masonry</td>
<td>15</td>
<td>14</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Openings (a) Doors &amp; Windows (b) Ventilators</td>
<td>5</td>
<td>6</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Lintels and sunshades</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Floors</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Roofs</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Stairs and Stair Cases</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Form work</td>
<td>10</td>
<td>6</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Scaffolding, shoring and under pinning</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Carpentry and Joinery</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Surface Finishing</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Basic knowledge of equipment and construction machinery</td>
<td>8</td>
<td>6</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>110</strong></td>
<td><strong>68</strong></td>
<td><strong>10</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

Old Name subject :: New Name Subject

Building Construction :: Construction Practice.
Detailed Syllabus:

1. Introduction:
   1.1. Classification of Buildings as per NBC - Component parts of a building

2. Foundations:
   2.1. Definition
   2.2. Functions of Foundations
   2.3. Shallow and deep foundations (Definitions)
   2.4. Bearing capacity of soil
   2.5. Essential requirements of good foundation
   2.6. Classification of foundations
      2.6.1. Raft foundations
   2.7. Construction details of spread footing
      2.7.1. Foundation for walls
      2.7.2. Masonry and concrete pillars
      2.7.3. Stepped foundations
   2.8. Causes and importance of insecticides, pesticides and their treatments
   2.9. Causes of failure of foundations and remedial measures

3. Masonry:
   3.1. Stone masonry
      3.1.1. Definition
      3.1.2. Material required for stone masonry
      3.1.3. Classification of stone Masonry (mention names)
      3.1.4. Rubble and Ashlar masonry.
      3.1.5. Tools required for stone masonry
      3.1.6. Types of joints in stone masonry
      3.1.7. Supervising points to be observed in stone masonry.
   3.2. Brick masonry
      3.2.1. Definition
      3.2.2. Types of brick masonry
      3.2.3. English Bond - Flemish bond 1,11/2 2 Brick walls
      3.2.4. Defects in brick masonry
      3.2.5. Structures in brick masonry –
      3.2.6. Tools required.
      3.2.7. Supervising points to be observed in brick masonry.

4. Openings:
   4.1. Doors and Windows
      4.1.2. General Terms
      4.1.3. Types of Doors
      4.1.4. Types of windows
      4.1.5. Fixtures and fastenings for doors and windows.
   4.2. Ventilators
      4.2.1. Types of ventilators - Fixed, Swing.

5. Lintels and Sun-shades:
   5.1. Types of Lintels
   5.2. Definition of sun shade

6. Floors:
   6.1. General terms
   6.2. Types of floors
   6.3. Materials required for Cement concrete, Terrazzo, Mosaic, Marble and Stone slab floors
   6.4. Method of construction of Cement Concrete, Mosaic, Terrazzo and Marble floors.
7. Roofs
7.1. Definition
7.2. Classification of Roofs - Pitched roofs - King post, Queen Post
7.3. Steel Trusses –
7.4. Roof Covering Material for pitched roofs - Flat Roof - R.C.C. roof
7.5. Tools required to fix AC sheet GI sheet and Roof covering
7.6. Methods for fixing of AC sheet
7.7. General requirements
7.8. Weather proof course on R.C.C. roof.

8. Stairs and Staircases
8.1. Technical terms
8.2. Characteristics of a good Stair
8.3. Types of Stairs - Straight, Quarter turn, half turn, Doglegged, Open well, Bifurcated and Spiral stairs.

9. Form Work
9.1. Requirement of Form work
9.2. Material used for Form work
9.3. Removal of Form work
9.4. Failure of Form work
9.5. Form work for - Column, Footing, Columns and Stairs

10. Scaffolding, Shoring and under pinning
10.1. Definition
10.2. Types of scaffolding
10.3. Shoring and under pinning

11. Carpentry and Joinery
11.1. Technical terms
11.2. Classification of Joints
11.3. Tools used in carpentry

12. Surface Finishing
12.1. Plastering
   12.1.1. Purpose
   12.1.2. Types of Plastering
12.2. Procedure of plastering
12.3. Pointing
   12.3.1. Purpose
   12.3.2. Types of Pointing
12.4. Painting
   12.4.1. Method of Painting new and old surfaces - wood and metal surfaces

13. Basic Knowledge of Equipment and Construction Machinery
13.1. Bulldozers- Concrete Mixers- Cranes-Pulley Blocks- Pumps- Winches- Excavators etc.

Note: Latest Developments on this subject should be noted from time to time
## CONSTRUCTION TECHNOLOGY
### ESTIMATING & COSTING (THEORY)
#### II YEAR PAPER-II

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>TOPICS</th>
<th>NO. OF PERIODS</th>
<th>WEIGHTAGE OF MARKS</th>
<th>NO. OF SHORT QUESTIONS</th>
<th>NO. OF ESSAY QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Measurement of materials and works</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Types of Estimates</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Detailed and abstract estimate of buildings by using centre line method/ long wall and short walls methods</td>
<td>30</td>
<td>22</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Specifications and Analysis of Rates</td>
<td>30</td>
<td>18</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Earthwork Calculations</td>
<td>15</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
| 7     | Detailed estimates of  
1. Gravel Road  
2. Cement Concrete Roads  
3. Septic tank with Soak pit | 15             | 8                  | 1                      | 1                      |

**Total**                  | **110**         | **68**            | **10**             | **8**                  |

Note: Calculators are permitted for Examinations.
Detailed Syllabus:

1. Introduction to the Subject
   1.1. Definition of Estimation and costing
   1.2. Need for Estimation and costing

2. Measurement of materials and works
   2.1. Units of measurement for various items of civil engineering works
   2.2. Rules for measurement
   2.3. Different methods of taking out quantities - Centre line method - Long and short walls method

3. Types of Estimates
   3.1. Detailed Estimate
      3.1.1. Definition
      3.1.2. Stages of preparation
      3.1.3. Details of measurement and calculation of quantities and abstract of estimated cost
   3.2. Preliminary or approximate estimate
      3.2.1. Plinth area estimate
      3.2.2. Cubic rate estimate
      3.2.3. Estimate per unit base
   3.3. Problems in preliminary estimate

4. Detailed and abstract estimate of buildings by using centre line method/long and short walls method
   4.1. Single roomed building (Load bearing type structure)
   4.2. Two roomed building (Load bearing type structure)
   4.3. Single storied Residential building with number of rooms (Load bearing type structure)
   4.4. Single storied Residential building (Framed Structure type)
   4.5. Primary School building with sloped roof
   4.6. RCC Dog legged - Open well stairs
   4.7. Two storied residential building (Framed Structure type)
   4.8. Detailed estimate of compound wall and steps.

5. Specifications and Analysis of Rates
   5.1. Specifications for different items of work
   5.2. Cost of materials at source and at site
   5.3. Cost of Labour - Types of labour - Standard Schedule of rates
   5.4. Lead and Lift - Leads Statement
   5.5. Preparation of Unit rates for finished items of works
      5.5.1. Cement Concrete in foundation
      5.5.2. R.C.C. Works
      5.5.3. Brick masonry in cement mortar
      5.5.4. C.R.S. masonry in cement mortar
      5.5.5. Plastering in cement mortar
      5.5.6. Pointing in cement mortar
      5.5.7. Cement concrete flooring
      5.5.8. Doors and windows - paneled and glazed

6. Earthwork Calculations
   6.1. Trapezoidal - Prisomodial - Mid Ordinate - Mean sectional area rules for computing volumes in level sections for roads
   6.2. Taking out quantities from L.S. and C.S. in cutting and embankment

7. Detailed Estimates
   7.1. Gravel Road
   7.2. Cement Concrete Road
   7.3. Septic tank with Soak pit

Note: Latest development on this subject should be followed from time to time
## CONSTRUCTION TECHNOLOGY COURSE

### HIGHWAYS & CONSTRUCTION MANAGEMENT (THEORY)

**II YEAR  PAPER-III**

**Periods/ Week : 4**  

**Periods/ Year : 110**

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>TOPICS</th>
<th>NO. OF PERIODS</th>
<th>WEIGHTAGE OF MARKS</th>
<th>NO. OF SHORT QUESTIONS</th>
<th>NO. OF ESSAY QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction of Highways</td>
<td>12</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Highway Survey and Traffic Engineering</td>
<td>15</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Highway Construction and Maintenance</td>
<td>20</td>
<td>14</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Introduction of Construction Management</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Construction Planning</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Construction Labour</td>
<td>13</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Inspection and Quality Control</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Contracts</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Tender and Tender Notice</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>110</strong></td>
<td><strong>68</strong></td>
<td><strong>10</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>
Detailed Syllabus:

1. **Introduction of Highways**
   1.1. Importance of Transportation Engineering
   1.2. Classification of Roads
   1.4. Road widths for different classification of Roads
   1.5. Traffic lane width
   1.6. Camber – Recommended IRC values of Camber for different roads
   1.7. Gradients - Ruling Gradients
   1.8. Super elevation necessity

2. **Highway Surveys and Traffic Engineering**
   2.1. Alignment
   2.2. Factors influencing alignment of road in plain and hilly areas
   2.3. Surveys – Reconnaissance – Preliminary and Final location of surveys
   2.4. Road Junctions
   2.4.1. Road Intersections- Square Junctions – Acute Junctions- T-Junctions – Y-Junctions – Staggered Junctions – Multiple Junctions
   2.5. Traffic Islands
   2.6. Traffic Signs
   2.6.1. Types of Traffic signs
   2.7. Pavement Marking and Kerb Marking

3. **Highway Constructions and Maintenance**
   3.1. Purpose of Road Drainage
   3.2. Surface and subsurface drainage
   3.3. Typical Cross section of Highway in cutting and embankment
   3.4. Water bond macadam roads – materials used- maintenance of WBM road – Machinery used in construction – construction procedure
   3.6. Premix – methods – construction procedure

4. **Introduction of Construction Management**
   4.1. Construction in India
   4.2. Classification of construction work
   4.3. Stages in construction work
   4.4. Construction team
   4.5. Resource of Construction
   4.6. Functions of Construction management
   4.7. Scientific methods of construction management.

5. **Construction Planning**
   2.1. Job planning
   2.2. Technical Planning
   2.3. Pretender and Construction Planning - scheduling –
   2.4. Procurement of Labour, material and equipment
   2.5. Program of work.
6. Construction Labour
   6.1. Types of Labour
   6.2. Labour welfare
   6.3. Human relation
   6.4. Labour Insurance
   6.5. Payment of wages

7. Inspection and Quality Control
   5.1. Introduction
   5.2. Functions of Inspection Department
   5.3. Major items of controls

8. Contracts
   6.1. Legality of Contracts
   6.2. Types of Contracts
      6.2.1. Piece work contracts
      6.2.2. Item rate contract
      6.2.3. Percentage contract
   6.3. Merits and Demerits of each contract system

9. Tender and Tender Notice
   7.1. Necessity of Tenders
   7.2. Tender notice - EMD - opening of tenders
   7.3. Scrutiny of Tenders
   7.4. Acceptance of tenders
   7.5. Work Order
   7.6. Contract agreement
   7.7. Conditions of Contract

Note: All leading journals on Highways and Construction Management should be followed from time to time.
CONSTRUCTION TECHNOLOGY
CONSTRUCTION PRACTICE LAB (PRACTICAL)
II YEAR   PAPER-I

Periods/ Week : 4       Periods/ Year : 115

TIME SCHEDULE

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>No. of Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Setting of Brick for Spread Footing foundation (Dry Bricks without Motar)</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Stones</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>RCC Lintels &amp; Arches</td>
<td>20</td>
</tr>
<tr>
<td>5.</td>
<td>Doors and Windows</td>
<td>13</td>
</tr>
<tr>
<td>6.</td>
<td>Floors</td>
<td>13</td>
</tr>
<tr>
<td>7.</td>
<td>Roofs</td>
<td>13</td>
</tr>
<tr>
<td>8.</td>
<td>Stairs and Staircase</td>
<td>13</td>
</tr>
<tr>
<td>9.</td>
<td>Carpentry</td>
<td>8</td>
</tr>
<tr>
<td>10.</td>
<td>Scaffolding</td>
<td>10</td>
</tr>
</tbody>
</table>

Total                                             115

Scheme of Valuation:

<table>
<thead>
<tr>
<th>Component</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>20</td>
</tr>
<tr>
<td>Presentation</td>
<td>10</td>
</tr>
<tr>
<td>Viva</td>
<td>10</td>
</tr>
<tr>
<td>Record</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
</tr>
</tbody>
</table>

Old Name subject :: New Name Subject
Building Construction Lab :: Construction Practice Lab
Detailed Syllabus:

1. Introduction
   1.1. General clearance of the site.
   1.2. Layout for construction – Load bearing section and RCC Structure
   1.3. Excavation for an open Trench

2. Setting of Brick for Spread Footing foundation (Dry Bricks without Mortar)
   2.1. Setting of Bricks for 1 ½ Brick thick in English bond up to 2 Meter height (Dry Bricks without Mortar)
   2.2. Setting of bricks for 1 ½ Brick thick wall in Flemish bond 2 meter height (Dry Bricks without Mortar)
   2.3. Setting brick for 2 brick thick pillar up to 1.5 meter height (Dry Bricks without Mortar)
   2.4. To visit a building under construction at various stages of construction from excavation, foundation to completion of building.

3. Stones
   3.1. Use of dressing Tools
   3.2. Sharpening of Chisels for dressing stones
   3.3. Dress a stone and finish it to various surface finishes
   3.4. Identification of commonly used building stones.

4. RCC Lintels and Arches
   4.1. Students be asked to lay dry bricks in various forms, Arches at ground surface (This will include cutting of bricks to required shape)
   4.2. Bend Bar a 1.3 meter span brick lintel (student should be able to make standard hook)
   4.3. Lay a 1.3 meter span lintel at ground surface (without using mortar)

5. Doors and Windows
   5.1. Students be asked to go to the locality and record various types of doors used and also Timber used for them.

6. Floors
   6.1. To list the various operations of the construction of Floors of given type, during the construction of following buildings
      6.1.1. Government Residential buildings
      6.1.2. Government Public buildings
      6.1.3. Private residential buildings
   (The student will also be asked to list down the deviations from theory lesson in operations observed)

7. Roofs
   7.1. Preparation of False ceiling and wood paneling
   7.2. Study of Construction of RCC roof and RBC roof of Buildings under constructions. Students will note down details of arrangement. He will also observe the process of mixing and laying of concrete and pipe layout for electrical wiring.

8. Stairs and Staircase
   8.1. To study the construction of foundation for Staircase
   8.2. To study the shuttering arrangement done for staircase
   8.3. To study the Bar laying arrangement done for staircase
   8.4. To study the laying of cement concrete for a staircase.
   (The teacher should keep in touch with the construction work in the locality and thus find out the stage at which the construction work is to be shown to the student)
9. **Carpentry**
   9.1. Use of the carpentry tools for sawing, planning, turning, chiseling, cutting and preparation of various wooden joints.
   9.2. Exercises involved in the use of Screws, nuts, bolt and glue etc.
   9.3. Visit to saw mill.

10. **Scaffolding**
   10.1. Erection of scaffolding by various materials available (The student should be able to make various rope knots for the purpose of scaffolding and should be attached in batches with scaffold and carpenter who is executing work locality)
   10.2. Visit to construct site for studying the shuttering and scaffolding use.

Note: Latest methods and techniques on this subject should be followed from time to time.
CONSTRUCTION TECHNOLOGY
SURVEYING II LAB (PRACTICAL)
II YEAR PAPER-II

Periods/ Week : 4
Periods/ Year : 115

TIME SCHEDULE

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>No. of Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Methods of Leveling</td>
<td>20</td>
</tr>
<tr>
<td>2.</td>
<td>Plotting the Longitudinal and Cross sections</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>Difficulties faced in Leveling</td>
<td>15</td>
</tr>
<tr>
<td>4.</td>
<td>Methods of Contouring</td>
<td>15</td>
</tr>
<tr>
<td>5.</td>
<td>Plotting the contours</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>Land Development and Site surveys</td>
<td>30</td>
</tr>
<tr>
<td>7.</td>
<td>Plotting the details of survey field work by ‘total station’</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>115</strong></td>
</tr>
</tbody>
</table>

Scheme of Valuation:

- Experiment 20 Marks
- Presentation 10 Marks
- Viva 10 Marks
- Record 10 Marks
- Total 50 Marks

Old Name subject :: Subject Changed as
Civil Engineering Drawing :: Surveying –II Lab.

Note: Entire syllabus in Civil Engineering Drawing is introduced in Auto CAD Lab. For learning is must for Job Opportunities in Industries and private sector.
Detailed Syllabus:

1. **Methods of Leveling**
   1.1. Simple Leveling
   1.2. Differential, Compound or continuous Leveling
   1.3. Fly Leveling
   1.4. Check Leveling
   1.5. Profile Leveling or Longitudinal sections and Cross sections
   1.6. Reciprocal Leveling

2. **Plotting the Longitudinal and Cross sections**
   2.1. Plotting the Longitudinal sections and Cross Section for the given 1 kilometer road.

3. **Difficulties faced in Leveling**
   3.1. When the Staff is too near to the instrument
   3.2. Leveling across a summit or a depression
   3.3. Leveling on steps slopes
   3.4. Leveling across a pond or a lake
   3.5. Leveling across a River
   3.6. Leveling past a wall
   3.7. Staff station is above the line of sight
   3.8. Staff station much below the line of sight

4. **Methods of Contouring**
   4.1. Methods of Squares
   4.2. Cross section method

5. **Plotting the Contours**
   5.1. Plotting the contours given intervals by the method of squares

6. **Land Development and Site Surveys**
   6.1. Divide the areas into plots using town planning rules
   6.2. Prepares the building plan in the given plot as per the town planning rules
   6.3. Setting out Center lines and foundation widths from the given drawings for excavation

7. **Plotting the details of survey field work by ‘total station’**:

   Note: Conduct the survey camp for six days using different methods of Surveying & Instruments and Submit a Report.
## TIME SCHEDULE

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>No. of Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Basic Concepts</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Practice on basic commands</td>
<td>9</td>
</tr>
<tr>
<td>3.</td>
<td>The Laying out the walls</td>
<td>9</td>
</tr>
<tr>
<td>4.</td>
<td>Draw the steps thresholds</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Drawing the Roof</td>
<td>9</td>
</tr>
<tr>
<td>6.</td>
<td>Generating the Elevation</td>
<td>9</td>
</tr>
<tr>
<td>7.</td>
<td>Controlling the text in Drawing</td>
<td>9</td>
</tr>
<tr>
<td>8.</td>
<td>Residential buildings</td>
<td>25</td>
</tr>
<tr>
<td>10.</td>
<td>Drawing to be submitted for approval</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>115</strong></td>
</tr>
</tbody>
</table>

### Evaluation of Practical Examination:

1. Preparation of Electronic Drawing Sheet  10 Marks
2. Setting Limits                          5 Marks
3. Drawing                                 10 Marks
4. Dimensioning, Text Title Block          5 Marks
5. Viva Vice                               10 Marks
6. Submission of Records                   10 Marks

50 Marks

Old Name subject :: New Name Subject
Computer Lab :: Auto CAD Lab.
Detailed Syllabus:

1. Basic Concepts
   1.1. Command window
   1.2. Drop Down Menus
   1.3. Tool bars

2. Practice on Basic Commands
   2.1. Line command - Drawing the Box - Drawing Units - Drawing Size

3. The Laying out the walls
   3.1. Creating Doors & Windows

4. Draw the steps and Thresholds
   4.1. Balcony –
   4.2. Laying out the Kitchen and Bathroom

5. Drawing the Roof
   5.1. Develop the drawing depicting the Reinforcement details of typical elements like column, footing, beams and slabs

6. Generating the elevations
   6.1. Drawing the front elevation
   6.2. Putting the door, step, windows
   6.3. Finishing touches
   6.4. Hatching the front elevation.

7. Controlling the text in a drawing
   7.1. Setting up Text styles
   7.2. Using Single line Text
   7.3. Placing Room Labels in the floor plan
   7.4. Creating a Title Block and Border

8. Residential buildings
   8.1. Plan, elevation, section of single roomed building
   8.2. Single storied load bearing type residential building
   8.3. One Bed – Room House
   8.4. Two Bed Room House
   8.5. Single storied frame structure type residential building
     8.5.1. One bed room house
     8.5.2. Two bed room house

9. Layouts of Electrical, Water supply and Sanitary Lines in Buildings
   9.1. One bed room house
   9.2. Two bed room house

10. Drawing to be submitted for approval to Corporation or Municipality showing required details in one sheet such as
    10.1. Plan – showing dimensions of all rooms
    10.2. Section – showing specifications and typical foundation details
    10.3. Elevation
    10.4. Site Plan – showing boundaries of site and plinth area, car parking, passages and location of septic tank.
    10.5. Key Plan – showing the location of building
    10.6. Title Block - showing the signature of the owner and licensed surveyors
    10.7. Minimum set-backs and height stipulation for all types of norms high rise buildings
    (for existing areas / new development areas / lay out areas including specified areas)

Note: Latest methods and techniques on this subject should be followed from time to time.
List of Equipments:

1. Drawing table with drawing boards.
2. T-square/Mini drafter
3. Drawing instruments set.
4. Set Square set,
5. Compass set
6. Plumb bob cross staff
7. Tapes
8. Spirit level
9. Bar bending bench
10. Bar bending tools (complete set with different diameters)
11. Survey chain (30 meters)
12. Dumpy level with stand
13. Cross staff
14. Theodolite with stand
15. Plane table with stand
16. Helmets
17. Gum boots
18. 1mt x 1 mt x 0.01 nt (Mixing tray)
19. Weighing balance
20. Trowels
21. Cement Concrete cube moulds
22. Slump cone apparatus.
23. Compressive testing Machine (100 tonnes capacity)
24. Set of sieves 80 mm, 40 mm, 20mm 10mm, 4.75 mm, 2.36 mm
   1.18 mm 0.6 mm, 0.3 mm, 0.15 mm
25. Sieve Shaker for coarse aggregate. (30 cm Dia)
26. Vicat apparatus
27. I.S. Testsieve - sieve No. 90 Microns
28. Weighing Balance (wt. 50 gm - to 5 kgs)
29. Fractional weight Box
30. Table Vibrator
31. Needle vibrator
32. Drawing Models
33. Drawing Model with sections.
34. Computers
35. Total station (surveying instrument)
36. Distomate
IMPRESSIVE SUGGESTIONS

1. Local visits to the buildings under construction such as residential buildings, multi-storey buildings, factory buildings and water supply treatment plants, etc, shall be arranged for practicals wherever necessary.

2. Local visits to sewage treatment plants, multi-storey buildings, study of water supply and sanitary fittings, etc, may be arranged.

3. Educational tour and visits to Engineering works may be arranged.

4. The On the Job Training programme may be arranged in specific areas like masonry work, plumbing, carpentry, bar-bending, painting etc.

5. For all practical subjects field visits should be there as per the syllabus.

6. Scientific calculators are allowed for this course student in the Public Examinations.

COLLABORATION INSTITUTIONS FOR CURRICULUM TRANSACTION

a) Collaboration Institutions for curriculum transaction

1. Technical training institutes (like Polytechnics, survey of India, Technical Teachers training institutes, Testing labs, (NAC) National Academy of Constructions)

2. Panchayat Raj Department

3. Roads & Buildings Department

b) On the Job Training Sites:

1. Government Departments like R & B, MCH, Huda, MES, Concrete ready Mix plants, Private builders and contractors, Building Materials Manufacturing Units like Tiles/ Bricks industries/ precast units/ cement industries.

2. All activities/ works related to transportation engineering etc, (highways, railways, airways, waterways).

3. All works related to Civil Engineering Field.

Evaluation:

1. Project work
2. Seminar on the project
3. Viva – voce
QUALIFICATIONS OF LECTURERS

a) B.E./B.Tech in Civil Engineering /AMIE (Civil) Equivalence
b) Diploma in Civil Engineering with 5 years teaching experience

Qualification of Lab Assistants:

a) Vocational passouts of R&B/CT/S&E/WS& SE/BC&MT/Public Health Engineering Technician
b) NCVT/ITI passed or any equivalent

VERTICAL MOBILITY

Passouts of this course may continue education in the following courses.

a) With Bridge Course :
   For further studies, joining in Polytechnics 2nd year,
   Writing EAMCET Exams, admission into any graduation courses.

b) Without Bridge Course :
   Self employment and wage employment
   B.A., B.Com., B.Com Computers, CA, ICWA, ACS, LLB etc.
**Reference Books:**

1. **Construction Materials**
   - Construction Materials by G.J. Kulkarni
   - Building Materials by Rangawala

2. **Surveying**
   - Survey I and II by B.C. Punmia
   - Surveying and levelling by T.P. Kanetkar
   - Surveying and levelling by S.K. Hussain and Nagaraj
   - Surveying and levelling by A. Kamala.

3. **Engineering Mechanics**
   - Engineering Mechanics — R.S. Kurmi
   - Engineering Mechanics — N. Srinivasulu
   - Engineering Mechanics — A. Kamala & AVRT sharma
   - Engineering Mechanics — Prasad
   - Engineering Mechanics — Ramamrutham
   - Engineering Mechanics — G. Venkateswar Rao
   - Engineering Mechanics Statics — Dayarathnam

4. **Engineering Drawing**
   - Engineering drawing by — N.D. Bhatt
   - Engineering drawing by — B.R. Gupta
   - Engineering drawing by — Srinivasulu
   - Engineering drawing by — Gurucharan Singh

5. **Building Construction**
   - A text book of Building Construction by — R.S. Desh Pande
   - A text book of Building Construction by — Rangawala
   - A text book of Building Construction by — Sushil Kumar
   - A text book of Building Construction by — S.P. Arora

6. **Estimating and Costing**
   - Estimating and Costing by — B.N Dutta
   - Estimating and Costing by — Birdie
   - Quantity surveying by — A.K. Kamala

7. **Civil Engineering Drawing**
   - Civil Engineering Drawing I and II by — A. Kamala
   - Civil Engineering Drawing 'A' Series — V.V.S. Murthy
   - Civil Engineering Drawing by — B.P. Vermon

8. **Transportation Engineering**
   - S.C. Rangawala  Khanna and Justo

9. **Construction Management and Accounts**
   - Construction Management by — N. Srinivasulu
   - Construction Management and Accounts by — V.N. Vazirani
   - Construction Management and Planning by — B. Sengupta, H. Guha.
   - Construction Management and Accounts — Sharma

10. **Computers**
    - Computers Science — E. Balagurusamy and Sushila : Tata McGraw Hills
    - Computers Methods of Structures by Dr. Mukherjee and Sans.
    - MS.Office - Ron Mansfield - BPB Publisher inside Auto CAD – Raiker
    - Auto CAD - David Frey - BPB Publisher
    - Computer Applications in Civil Engineering by NITTTR Chennai
    - Course material on modern surveying instruments by NITTTR Chennai
MODEL QUESTION PAPER

CONSTRUCTION TECHNOLOGY

CONSTRUCTION MATERIALS (THEORY)

PAPER - I

1ST YEAR

TIME: 3 HOURS         MAX MARKS: 50

SECTION – A                                             10X2=20

NOTE: ANSWER ALL QUESTIONS

EACH QUESTION CARRIES 2 MARKS

1. Write advantages of fly ash bricks.
2. State the classification of roofing tiles.
3. Define quick line.
4. Write chemical composition of roofing tiles.
5. Define bulking of sand.
6. Write classification of mortars.
7. Write defects in timber.
8. Write the uses of cast iron.
9. Write the functions of points.
10. Define thermocole.

SECTION – B                                                                   5X6=30

NOTE: ANSWER ANY 5 QUESTIONS

EACH QUESTION CARRIES 6 MARKS

11. Write and explain the geological classification.
12. State the important eight characteristics of good bricks used for construction heavy load bearing walls of a building.
13. Write types of flooring tiles and explain briefly.
14. Explain the manufacture of ordinary portland cement by dry process
15. Define water cement ratio and explain the procedure for placing of concrete.
16. Write types of vibrators and explain any one.
17. Write chemical composition of wrought iron and its properties.
18. Write ingredients of paint and characteristics of good paint.
MODEL QUESTION PAPER
CONSTRUCTION TECHNOLOGY
SURVEYING (THEORY) COMMON TO CT, BC & MT
1ST YEAR

TIME: 3 HOURS         MAX MARKS: 50

SECTION - A
NOTE: ANSWER ALL QUESTIONS 10X2=20
EACH QUESTION CARRIES 2 MARKS

1. Write purpose of surveying.
2. Write obstacles in chain surveying.
3. Define local attraction.
4. Convert the following W.C.B into R.B
   A. 135 degrees 30 minutes
   B. 210 degrees 15 minutes
5. Write the types of levelling instruments.
6. Define back sight and fore sight.
7. Define face left and face right observations.
8. Write the sketch showing 104 degrees 20 minutes 30 seconds in combination of main and vernier scale of theodolite
9. Write any four component parts of a total station.
10. Define distomat.

SECTION - B
NOTE: ANSWER ANY 5 QUESTIONS 5X6=30
EACH QUESTION CARRIES 6 MARKS

11. Explain the direct method of chaining on sloping ground.
12. The following offsets were taken from a chain line to a hedge
    Distance in Mt. 0 20 40 60 80 100 120
    12 10 8 6 4 5 7
    Calculate the area in sq.mt enclosed by the chain line, the hedge and the end offsets by Simpson’s rule
13. Draw a neat sketch of a prismatic compass and label the parts.
14. Determine the values of included angles in a closed compass traverse ABCD, conducted in the clockwise direction given the following fore bearing of the respective lines.
    Line   fore bearing
    AB    40 degrees
    BC    70 degrees
    CD    210 degrees
    DA    280 degrees
    apply check
15. Write and explain about the temporary adjustments of a dumpy level.
16. The following consecutive readings were taken with a dumpy level
    1.895, 1.5, 1.856, 2.57, 2.99, 2.02, 2.41, 2.52 and 2.96 the level was shifted after fourth, and sixth readings. The RL of the first point was 100.00 mt. Rule out a page of a level book and apply the usual checks.
17. Explain determination of horizontal angle by repetition method in theodolite
18. Explain the procedure measuring horizontal distance by using total station.
MODEL QUESTION PAPER
CONSTRUCTION TECHNOLOGY
ENGINEERING MECHANICS (THEORY) COMMON TO CT, BC & MT
1ST YEAR

TIME: 3 HOURS         MAX MARKS: 50

SECTION – A                                             10X2=20
NOTE: ANSWER ALL QUESTION
EACH QUESTION CARRIES 2 MARKS

01. Define derived units.
02. Define vector and give examples.
03. Write the characteristics of force.
04. Define triangular law of force.
05. Draw a position of a centroid for the following
   A. Triangle
   B. Trapezoidal
06. State the hooks law.
07. Define shear modulus.
08. Define long column
09. Write types of beams.
10. Define bending moment and shear force.

SECTION – B                                             5X6=30
NOTE: ANSWER ANY 5 QUESTIONS
EACH QUESTION CARRIES 6 MARKS

11. A). Explain law of parallelogram of forces with neat sketches.
    B). Two forces 30 kn and 20 kn acting at 60 degrees to each other. Calculate the resultant of forces.
12. Determine the position of centroid of an “I” section of
    Top flange   120mm x 20mm
    Web          20mm x 90mm
    Bottom flange 110mm x 20mm
13. Find the moment of inertia of a given “T” section about xx axis passing through centroid.
    Flange   110mm x 15mm
    Web     20mm x 120mm
14. A circular bar 10mm diameter, 300mm long was tested in tension. The increase in its length was
    found to be 1.5mm while the decrease in its diameter was 0.03mm. Calculate the longitudinal strain,
    lateral strain, poission’s ratio.
15. A steel rod 20mm dia is subjected to a pull of 3KN, what are the longitudinal and transverse strains
    if and Poisson’s ratio is 0.3.
16. A steel rod 5 m long and of 4 cm diameter is used as a column, with one end fixed and the other free.
    Determined the crippling load by Eulers formula. Take
17. A cantilever beam of span 5mt having point loads 10kn, 15kn at free end and 2mt from fixed end.
    And also udl of 2KN/m acting 2mt from free end. Draw shear force and BMD. The sketch is shown.
18. A simple supported beam 4mt-span is subjects to a point load 10kn, 20kn and 30kn at 1mt, 2mt and
    3mt from left hand support. Draw shear force bending moment. The sketch is shown.
MODEL QUESTION PAPER
CONSTRUCTION TECHNOLOGY
CONSTRUCTION PRACTICE (THEORY)
2ND YEAR

TIME: 3 HOURS          MAX MARKS:50

SECTION – A           10X2=20

NOTE: ANSWER ALL QUESTIONS
EACH QUESTION CARRIES 2 MARKS

1. Define foundation
2. Write materials and tools used in stone masonry
3. Define RCC lentel
4. Write any four types of floors.
5. Write about pitched roofs.
6. Define rise and tread.
7. Write any four types of stairs.
8. Define under pinning.
9. Write any four tools used in carpentry.
10. Write types of plastering.

SECTION – B

NOTE: ANSWER ANY 5 QUESTIONS       5X6=30

EACH QUESTION CARRIES 6 MARKS

11. Explain about construction details of spread footing.
12. What are the points to be observed while constructing, stone masonry?
13. Define English bond and Flemish bond and explain each one.
14. Draw a neat sketch of panel door and label the parts.
15. Write the method of construction of cement concert floor.
16. Explain about RCC roof.
17. Draw a neat sketch of a column form work and identify the parts.
18. Explain about the concrete mixers.
CONSTRUCTION TECHNOLOGY COURSE

MODEL QUESTION PAPER
CONSTRUCTION TECHNOLOGY
ESTIMATION & COSTING (THEORY)
2ND YEAR

TIME: 3 HOURS         MAX MARKS:50

SECTION -A

NOTE: ANSWER ALL QUESTIONS          10X2=20
EACH QUESTION CARRIES 2 MARKS

1. Write The Units Of Measurements For
   A. Earth Work
   B. Plastering

2. Write The Abstract Estimate Format

3. Estimate The Quantity Of Brick Work For A Wall Of Length 5 Mt Width 20 Cm And Height 2.8 Mt


5. Write The Specification For Plastering

6. Define Lead And Lift.

7. Estimate The Quantity Of Cement, Sand Required For Cm(1:8) For 1 Cum

8. A Cave Is In Cutting And Has A Width Of 4 Mt At Bottom. If The Depth Of Cutting Is 2.0 M And Side Slopes 1.5:1. Find The Area Of Cross Section.


10. Write Any 4 Component Parts of a Fixed Septic Tank

SECTION – B

NOTE: ANSWER ANY 5 QUESTIONS         5X6=30
EACH QUESTION CARRIES 6 MARKS

   1. Plinth Area Rate 3000/Sqm
   2. Add For Architectural Work 2.5% Of The Cost.
   3. Add For Water Supply And Sanitary Instalation 5% Of The Cost
   4. Contingencies 3% Of The Cost.
   5. Super Vision Charges 2% Of The Cost.

12. Estimate The Quantities Of The Following Items Of A Given Two Room Building Shown In Figure
   A. Earth Work Excavation.
   B. Flooring

13. Calculate The Quantities Of The Following Items By Center Line Method For The Building Shown In Figure
   A. Brick Work In Super Structure
   B. CC Bed

14. Estimate the Quantities Of The Following Items Of Work For Compound Wall 70m Length, 30cm Width And 2 Mt Height.
   A. Brick Work In Cm(1:4) Above Plinth
   B. Plastering Work

15. Estimate The Materials Required For
   A. CC(1:2:4)
   B. Brick Work Cm(1:1.5:3)

17. The Ground Levels along Center Line of a Road All Given Below.

<table>
<thead>
<tr>
<th>Chainage in Mt</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>RL of Ground</td>
<td>97</td>
<td>96.5</td>
<td>96</td>
<td>97.5</td>
</tr>
</tbody>
</table>

The Road is to be Formed In Embankment With the Formation Level At 100.00 M Throughout The Length. If The Width Of The Road Is 10.00 M And The Side Slopes 2:1. Calculate the Quantity of Earth Work Required By 1) Trapezoidal 2) Prismsoidal Rule. Assume the Transverse Slope As Level.

18. Prepare The Detail Estimate For The Cement Concrete Road Of 1.0KM Length For The Following Items Of Work As Shown In Figure

A. Wearing Coat CC(1:2:4) With 20mm Size HBG Metal 100mm Thick
B. Base Course CC (1:4:8) With 40mm Size HBG Metal 150mm Thick
MODEL QUESTION PAPER
CONSTRUCTION TECHNOLOGY
HIGHWAYS & CONSTRUCTION MANAGEMENT (THEORY)
2ND YEAR

TIME: 3 HOURS         MAX MARKS:50

SECTION – A           10X2=20

NOTE: ANSWER ALL QUESTIONS
EACH QUESTION CARRIES 2 MARKS

1. State any four advantages of roads.
2. Write any three objects of reconnaissance survey.
3. What are the objects of traffic signs?
4. Write the materials used in the construction of WBM road.
5. Write the stages in construction.
6. Define contract planning.
7. Write the types of labour.
8. Define quality control
10. Define work order.

SECTION – B

NOTE: ANSWER ANY 5 QUESTIONS

EACH QUESTION CARRIES 6 MARKS

11. Explain the functions of the component Parts of Road Structure With Sketch
12. Explain the Different Junctions With Sketches
13. Explain the Steps Involved In The Construction Of Cement Concrete Roads.
14. What is meant By Seal Coat and Write Three Functions of Providing It.?
15. What are the Methods of Scheduling? Explain Them Briefly.
16. Write Short Notes On
   A. Minimum Wage Act
   B. Contract Labour Act
17. Explain Various Types Of Contracts.
18. Write Short Notes On
   A. Work Order.
   B. Tender Notice.
MODEL PRACTICAL EXAMINATION QUESTION PAPER
COMMON TO (CT, BC & MT COURSES)
1ST & 2ND YEAR EXCEPT DRAWING

TIME: 3 HOURS         MAX MARKS: 50

PART – A

ONE QUESTION ALLOTED BY LOT

EXPERIMENT                        MARKS: 20
PRESENTATION                      MARKS: 10

PART – B

VIVA – VOICE                      MARKS: 10

PART – C

RECORD                            MARKS: 10
CONSTRUCTION TECHNOLOGY
MODEL PRACTICAL QUESTION PAPER – I YEAR
CONSTRUCTION MATERIALS PRACTICAL’S

Time: 3hours Max. Marks: 50

SECTION – A

Note: Answer one question by taking lot Marks: 20+10=30

1) To determine the quality of proper graining of Cement
(Or)
To determine the fineness of the Cement

2) To determine the percentage of Water required for preparing Cement paste of standard or normal consistency

3) To find the initial setting time of supplied Cement sample

4) To determine the water absorption of course aggregate

5) To determine the fineness modulus of fine aggregate by Sieve analysis

6) To determine the fineness modulus of course aggregate by sieve analysis

7) To determine the water absorption of given sample of brick

SECTION - B

1. Viva – voice 10 marks

SECTION – C

1. Records submission 10 Marks
CONSTRUCTION TECHNOLOGY

MODEL PRACTICAL QUESTION PAPER – I YEAR

SURVEYING LAB-I

TIME: 3HOURS

MAX.MARKS: 50

SECTION – A

Note: Answer one question by taking lot

Marks: 20+10=30

1. Given building plan (single line diagram) mark the column positions in fields by taking perpendicular offsets
2. Using chain and tape draw the given position of the building corners by arc method
3. By giving four surveying stations in fields measuring the bearings of all the stations by giving prismatic compass also calculate included angles.
4. To determine the elevations of a given four points in a field that is A,B,C,D. taking B.M as 100.00 M at field of height station. Enter into the field book and apply usual check.
5. To determine horizontal angle of AOB given survey stations A &B
6. Total station and description and parts

SECTION - B

1. Viva – voice

10 marks

SECTION – C

1. Records submission

10 Marks
CONSTRUCTION TECHNOLOGY
Model Practical Question Paper – I YEAR
ENGINEERING DRAWING

Time: 3 hours
Max. Marks: 50

SECTION – A

Note: Answer all questions
Each question carries 2 marks 5 \times 2 = 10

1) Draw the word CIVIL ENGINEERING Lettering of height 18 mm
2) Given simple figure draw front view (not to scale)
3) 12 mm dia bar of length 4 mt used in simple supported beam sp.wt of bar is 0.89 kg /m find the weight of the bar
4) Identify any 4 input devices of a computer
5) What are different type of charts in Excel

SECTION – B

Note: answer any 3 questions.
Each carries 10 marks 3 \times 10 = 30

6) Draw an Ellipse by concentric e circle method major axis as 110 mm and minor axis as 80mm
7) Problem on orthographic projection.
8) For a given figure draw a top view and side view.
9) Draw a longitudinal section S.S.B of span 3 meter for the following details
   End support wall thickness= 300 mm
   Depth of a beam = 300 mm
   Main rain reinforcement = 4, 12mm dia bar at bottom
   Top bars = 2,10mm dia bars
   12mm dia bars are cranked at the distance of 0.75 m from both ends. Assume suitable cover and scale
   Stirrups =2L, 6mm dia at 220 mm centre to centre.
10) Explain the processor of mail merge.
List of Participants:

1. **Sri Er. M. Laxmanachary**  
   M.E (Struct.) M.I.E, Civil Engineer. F.I.V,  
   Chief Consultant & Approved Valuer,  
   GHMC, Licensed Structural Engineer.

2. **Sri P. Anil Kumar, B.E,**  
   Senior Lecturer,  
   KN Polytechnic, Hyderabad.

3. **Sri V. Venkata Seshaiah, B.E,**  
   J.L in Civil Engineering (CT),  
   Prakasam District.

4. **Sri K. Prasad,**  
   Course Co-Ordinator  
   Jr. Lecturer (EW& SEA),  
   GJC New Malakpet, Hyderabad.

5. **B.Gnana Sagar,**  
   Professor (FAC), S.I.V.E., & Deputy Director,  
   O/o the Commissioner of Intermediate Education,  
   Andhra Pradesh,  
   Hyderabad