SURVEYING – II

Lectures / Tutorials : 4 Periods/Week — Sessional marks : 40
Semester End Exam. : 3 Hours — Semester End Exam. marks : 60
Credits : 4

Course objectives:

- To introduce the EDM methods and to study about total station and working
- To deal with various methods employed for the measurement of areas and volumes.
- To determine distances and relative positions using tachometric surveying and trigonometric leveling.
- To study different methods of setting out simple, compound and reverse curves.
- To study the design of simple circular curves.
- To study the positioning of structure, setting out foundation, setting out a sewer and setting out culvert.
- To study different methods of measurement and necessary corrections to be made for base line

Course outcomes:

- The students will be able to:
- To know about the total station.
- He gains enough knowledge about theodolite traverse & tachometric survey.
- To find out the reduced level of different structures base is inaccessible and accessible.
- To know about how to provide the curves for a roads.
- To know about the positioning of structure from plan to the ground.

UNIT – 1

Modern Systems in Surveying

Digital theodolite; Electronic Total Station; Digital Level; Global Positioning System; Electronic Distance Measurements - Basic concepts, Instrumental errors in EDM

Computation of Areas

Introduction; Simpson's rule; Boundaries with offsets at irregular intervals; Meridian methods; Coordinate method; Planimeter – Area of Zero circle. Area of cross sections – two level section only

UNIT – II

Computation of volumes

Trapezoidal rule; Prismoidal formula; Volume from spot levels; volume from contour plan; Capacity of a reservoir

Trigonometric Leveling

Introduction; Plane trigonometric leveling methods - When base of the vertical or inclined object accessible and when base of the object is not accessible; Axis signal correction; Difference in elevation by single observation and reciprocal observations.

UNIT – III

Tacheometric Surveying

Advantages of tachometric surveying; Basic systems of tachometric measurements; Principle of stadia measurements, Determination of constants K and C; Inclined sight with staff vertical; Inclined sight with staff normal to the line of sight.

Construction Surveying

Horizontal Control - Reference grid; Vertical Control; Control stations; Positioning of a structure; setting out a building – reference pillars and Batter boards; setting out a culvert; Grade stakes; Boning rods or travelers; Sight rails; Slope rails; Profile boards or batter boards; Setting out grades for sewers and pipe lines; setting out slopes in embankment and cutting;

UNIT – IV

Curves Ranging

Circular curves - Basic definitions; Designation of a curve; Relationship between radius and degree of curve; Elements of a simple circular curve; Location of the tangent points; selection of peg interval; Methods of setting out; Problems in setting out curves; Compound and Reverse curves;

NOTE

Two questions of 12 marks each will be given from each unit out of which one is to be answered. Twelve questions of one mark each will be given from entire syllabus which is a compulsory question.

TEXT BOOKS

1. Surveying Vol I & II by K R Arora,11th Edition, Standard Book house, 2012.

REFERENCE TEXT BOOKS

1. Plane Surveying by AM Chandra, 2nd Edition,New Age International (P) Ltd.,2006.
2. Fundamentals of Surveying by S K Roy, 2nd Edition,Prentice- Hall of India Private Ltd.,2010.
3. Surveying Vol-I&II by B.C. Punmia ,Laxmi Publications,2005.

WEB REFERENCES:

- http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-ROORKEE/SURVEYING/home.htm
- http://www.engineeringcivil.com/theory/surveying/
- http://www.engineeringcivil.com/theory/civil-engineering-notes-from-universities/