31242- SURVEY THEORY

DETAIL SYLLABUS

UNIT I 1.1 CHAIN & COMPASS SURVEYING

INTRODUCTION:

Definition – object of surveying – Division of surveying – plane and geodetic survey – classification of survey. Chain surveying: Instruments used for chaining – chain – Types – Ranging-Types – Direct & Indirect ranging- Terms used in chain surveying - Baseline – Check line – Tie line – offsets – Types of offsets (Description only). – Accessories used in chain surveying. Compass surveying: Purpose of compass surveying – construction & working of prismatic compass – use of prismatic compass – setting and taking observations – magnetic dip & declination - magnetic & true meridian – magnetic true & Arbitrary bearing – WCB &RB – Fore and back bearing –Local attraction (description only) calculation of included angle – closed frame work - simple problems only.

1.2 LEVELLING:

Levelling –levels –functions – Types of levels – Dumpy level – Modern Tilting Levels – Quick setting levels – Automatic and laser level – Levelling staff – Types – Component parts of a levelling instruments – Temporary adjustment –Back Sight - Fore sight – Inter sight – Change point – Bench mark – Height of instrument – Reduction of levels – Methods – Height of collimation and Rise and fall method – Simple Problems – Curvature and Refraction (No problem) – simple levelling – Fly levelling – Check levelling –Profile and cross sectional levelling.

UNIT II

2.1 THEODOLITE:

Type of Theodolite – Transit and non-Transit theodolite – Vernier and Micrometre Theodolite – Electronic Theodolite principles (Description only) – Component parts of theodolite – Functions – Technical terms used in Theodolite survey – Temporary adjustment – Fundamental lines – Relation between them – Measurement of Horizontal angle-methods-general, repetition and reiteration methods–measurement of vertical angle – Latitude and Departure –Consecutive coordinates – Independent coordinate – Computation of Area of closed traverse problems.

2.2 TRIGNOMETRICAL LEVELLING:

Finding elevation of objects – Base accessible – Base inaccessible – Single plane & Double plane methods – Simple problems.

UNIT III

3.1 TACHEOMETRY:

Instrument used – system of Tacheometry – stadia and tangential systems – principles – Tacheometric Constants –- Fixed hair method – Analatic lens (no Proof)

– Advantages and use – Distance and elevation formulae for horizontal and inclined sight- simple problems on determination of distance and elevation of objects(staff held only vertically)- determination of tachometric constants from field observations for horizontal and inclined line of sight –procedure- Simple problems – Electronic tacheometer (Description only) – Tacheometric Traverse – Errors in Tachometric work – TangentiaL method -Problems.

3.2 TOTAL STATION:

Introduction - applications of total station – components parts – accessories used – instrument preparation & setting and measurement – creating a new job – measuring magnetic bearing of a line – field procedure for co- ordinates measurements – field procedure to run a traverse survey-linking data files

UNIT IV

4.1 AREAS & VOLUMES

Computation of areas of irregular figure –General Methods of determining areas- Mid Ordinate rule-Average ordinate rule- Trapezoidal rule - Simpson's rule-Problems –Computation of Volume –computation of earth work from cross section - one Level Cross Section only–simple problems on embankment and cutting by trapezoidal and prismoidal formulae.

4.2 CONTOUR SURVEYING:

Definition – Contour – Contouring – Characteristics of Contours – Methods of Contouring – Direct and Indirect methods – Interpolation of contour – Contour Gradient – Uses of Contour plan and Map – Calculation of capacity of reservoirs – Simple problems.

UNIT V

5.1 GLOBAL POSITION SYSTEM (GPS):

Introduction – Fundamentals – Applications in Civil Engineering – GPS receiver- hand held GPS – Field procedure – Measurement of latitude, longitude & Altitude –– Differential GPS - Various satellites used by GPS.

5.2 GEOGRAPHICAL INFORMATION SYSTEM(GIS):

MAP – Types of Maps – Development of GIS – Components of GIS – Ordinary mapping to GIS – Comparison of GIS with CAD and other system– Cadastral surveys and Records – Application of GIS -Land Information System.

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3. "A Text Book of Surveying Levelling ", Khanna publishers Agor

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