

**M.A./M.Sc. Geography**  
**First Semester**  
**Practical- I (41365 A) Survey and Leveling**

**Unit – I**

- a) Surveying as an art and science, Principles of surveying
- b) General errors and inaccuracies in surveying
- c) Precautions in using survey instruments
- d) Trigonometrical methods of solution of triangles and computation of lengths

**Unit – II Plane table**

- a) Use of Plane table in composite surveys and related methods, methods of resectioning
- b) General planning of large area plane surveys
- c) A composite survey of college campus or village/neighbourhood
- d) Drawing of control points and surveyed plan

**Unit – III Theodolite and Tacheometer:**

- a) Theodolite as an instrument of surveying and leveling, adjustment of Theodolite
- b) Computation of Theodolite bearings
- c) Computation of length of triangles and plotting of control points
- d) Telemetry: stadia and tangential

**Unit – IV Clinometer**

- a) Use of Clinometer as instrument of leveling
- b) Measuring spot heights
- c) Contouring and interpolation of contours
- d) Drawing of profiles

**Unit – V Dumpy level:**

- a) Use of Dumpy level as an instrument of leveling and adjustment of the dumpy level
- b) Principles: Calculation of difference of level, series leveling, back sights, foresights, intermediate sights
- c) Level book and computation of reduced level: Rise and fall and collimation method
- d) Plotting of profiles

**Note:**

1. Candidates will submit following exercise as record work:
  - i. Resectioning: 3 exercises of geographical methods of Llano's, Bessel's and trial and error
  - ii. Profiles: 2 exercises based on leveling measurements obtained with dumpy level
  - iii. Contouring: 1 exercise based on leveling measurements obtained with dumpy level

- iv. Contouring: 1 exercise based on leveling measurements obtained with clinometers
  - v. Measuring and plotting reduced levels using tacheometer: 2 exercises
  - vi. Triangulation survey based on a minimum of 15 control points using theodolite: 2 exercises including one related to composite survey
  - vii. Plan of un-surveyed campus/neighbourhood/village area based on composite survey: 1 exercise (10 day's camp)
  - viii. Thematic maps showing characteristics of the surveyed area: form of built-up area, and building material: 6 exercises
2. All exercises will be based on surveying and leveling work done by the candidates themselves for areas hitherto un-surveyed

**References:**

1. Clark, D., Plane and Geodetic Surveying, Constable
2. Davis, R. E. and F. S. Foot, Surveying: Theory and Practice, McGraw Hill
3. Hinks, H.R., Map and Survey, Cambridge
4. Kanetkar, T. P., Surveying and leveling, Volume I & II, A. U. Grah Prakashan
5. Kiley, P. T., Surveying and leveling, Volume I & II, A. U. Grah Prakashan
6. Survey Manual, Volume I-VIII, Survey of India
7. Williamson, J. T., Surveying and Field Work, Constable

**Distribution of Marks  
100**

**Total Marks**

**A Part** –Practical paper of three hours duration will be held along with main theory paper examination. (40 marks)

- Section – A Objective type 5 marks. Asked 10 questions, attempt all questions.
- Section – B Short Answers – 20 marks, Asked 10 questions, one question from each unit and attempt five questions.
- Section-C Descriptive type-15 marks ,Asked 5 questions, one question from each unit and attempt two questions

**Practical** – Assessed by Internal Examiner

**B Part- Surveying –Practical Exam** (60 marks)

A - Test paper Survey exercise – 30 marks, Working on each instruments with following distribution of marks:

<b>Instrument</b>	<b>Exercise</b>	<b>Marks</b>	<b>Time (minute)</b>
A. Plane Table	Resectioning	10	35
B. Theodolite	Measurement of angle between two points	5	10
C. Dumpy Level	Measuring level difference between two distant	5	10

	points		
D. Clinometer	Measuring heights of and level difference between two distant points	5	10
E. Tacheometer	Measuring distance of any distant point	5	10

B - Record work – 20 marks

C - Viva-voce – 10 marks