SAMPLE PAPERS

DIPLOMA FIRST SEMESTER EXAMINATION 2025 (JUT)

BASIC SURVEYING

DIPLOMA WALLAH

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Instructions:

1. **Question No. 1 is compulsory.** It contains 7 MCQs of 2 marks each.
2. Answer any **FOUR** questions from the remaining (Q.2 to Q.7).
3. All questions (Q.2 to Q.7) carry 14 marks each (typically divided into 7+7).
4. Use neat sketches wherever necessary.

Q.1 Compulsory (7 × 2 = 14 Marks)

1. The primary objective of surveying is to prepare a:

a) Scale

b) Map

c) Notebook

d) Report

2. 1 Hectare is equal to:

a) 1,000 sq. m

b) 10,000 sq. m

c) 1,00,000 sq. m

d) 100 sq. m

3. The length of a Gunter's Chain is:

a) 66 feet

b) 100 feet

c) 33 feet

d) 20 meters

4. In a 20-meter metric chain, the number of links is:

a) 150

b) 100

c) 80

d) 200

5. The least count of a Prismatic Compass is approximately:

a) 15 minutes

b) 30 minutes

c) 1 degree

d) 5 minutes

6. Which instrument is used for setting out a right angle to the survey line?

a) Line Ranger

b) Offset Rod

c) Optical Square

d) Ranging Rod

7. The sum of the interior angles of a closed traverse with 'n' sides is:

a) (2n - 4) * 90°

b) (2n + 4) * 90°

c) (n - 2) * 180°

d) Both a and c

Theory Questions (Attempt any FOUR)

Q.2 A. State and explain the two fundamental Principles of Surveying. Why is "Work from Whole to Part" preferred? (7 Marks)

B. Differentiate between Plane Surveying and Geodetic Surveying. (7 Marks)

Q.3 A. Numerical: The following staff readings were taken with a level: 0.650, 1.455, 1.805, 2.340, 0.950, 1.250, 1.655, 1.890. The instrument was shifted after the 4th reading. The RL of the first point is 100.000m. Calculate RLs of all points using the **Height of Instrument (H.I.) Method** and apply arithmetic checks. (7 Marks)

B. Explain the various tape corrections, specifically detailing formulas for slope and temperature corrections. (7 Marks)

Q.4 A. Describe the construction and functions of various components of a Prismatic Compass with a neat sketch. (7 Marks)

B. Define Ranging. Explain the procedure for Direct Ranging with a suitable sketch. (7 Marks)

Q.5 A. Define Local Attraction. How do you detect and correct it in a closed traverse? (7 Marks)

B. Briefly explain the procedure for finding the distance between two non-intervisible survey stations. (7 Marks)

Q.6 A. Describe the construction and working of an Auto Level (or Dumpy Level) with a neat, labelled diagram. (7 Marks)

B. Explain how to calculate the interior angles of a closed traverse when the Fore Bearings (FB) of all lines are known. (7 Marks)

Q.7 Write Short Notes on any FOUR (3.5 × 4 = 14 Marks) [12]

a) Bench Mark (GTS and Permanent)

b) Base Line and Tie Line

c) Applications of EDM (Electronic Distance Measurement)

d) Magnetic Dip and Declination

e) Open vs. Closed Traverse

Solutions for Paper 1

MCQ Answer Key

1. b) Map
2. b) 10,000 sq. m
3. a) 66 feet
4. b) 100
5. b) 30 minutes
6. c) Optical Square
7. d) Both a and c

Short Answer Solutions (Q.7)

- **Bench Mark:** A fixed point of known elevation used as a reference. GTS BMs are established by the Survey of India; Permanent BMs are fixed points like plinths of buildings. [13]
- **Base Line/Tie Line:** Base Line is the longest main survey line. Tie Line is used to locate interior details like trees or poles.
- **EDM:** Modern surveying instrument using electromagnetic waves to measure distances accurately and quickly.
- **Magnetic Dip:** The vertical angle a needle makes with the horizontal; Declination is the horizontal angle between True North and Magnetic North.
- **Traverse:** Open traverse ends at a different point (e.g., roads); Closed traverse returns to the starting point (e.g., field boundary).

Model Answers for Long Questions

- **Q.2A Principles:** 1. Work from whole to part (prevents accumulation of errors). 2. Locate a point by at least two measurements.
- **Q.3A H.I. Numerical:** H.I. = RL + BS. New RL = H.I. - FS/IS. Check: \Sigma BS – σ FS = Last RL - First RL.