

SAMPLE PAPERS
DIPLOMA THIRD SEMESTER EXAMINATION 2025 (JUT)
MODERN SURVEYING
DIPLOMA WALLAH

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Full Marks: 70 marks | Time: 3 Hours

Instructions:

- Question No. 1 is compulsory.
- Answer any **FOUR** questions from the remaining (Q.2 to Q. 7 marks).

Q.1 Multiple Choice Questions (Compulsory) [2 × 7 = 14 Marks]

(i) The line joining points of equal elevation on the earth's surface is called:

(a) Isobar (b) Contour line (c) Isogonic line (d) Agonic line

(ii) Which of the following is NOT a part of a Total Station?

(a) EDM (b) Electronic Theodolite (c) Microprocessor (d) Planimeter

(iii) The prismoidal formula is also known as:

(a) Trapezoidal rule (b) Simpson's rule (c) Average end area rule (d) Mid-ordinate rule

(iv) The horizontal distance between two consecutive contours is called:

(a) Contour interval (b) Horizontal equivalent (c) Vertical interval (d) Gradient

(v) In tacheometry, if the staff is held inclined, the readings are:

(a) More accurate (b) Less accurate (c) Same (d) Difficult to calculate

(vi) Which component of GIS is responsible for data input and output?

(a) Software (b) Hardware (c) Methods (d) People

(vii) Refraction error in theodolite survey is minimized by:

(a) Face left and right observations (b) Reciprocal observations (c) Repetition method (d) Reiteration method

Q.2 (A) Explain the Temporary Adjustments of a Transit Theodolite. What is the difference between "Face Left" and "Face Right" observations? [7 Marks]

Q.2 (B) Derive the Distance and Elevation formulae for the Fixed Hair method in Tacheometry when the line of sight is Horizontal. [7 Marks]

Q.3 (A) (Numerical) Calculate the RL of a point C using Trigonometric Levelling.

- Instrument at A. Sight to C.
- Horizontal Distance AC = 120 m.
- Angle of Elevation = $+8^{\circ}30'$.
- Height of Instrument at A = 1.45 m.
- RL of A = 100.00 m. [7 Marks]

Q.3 (B) Explain **Bowditch's Rule** and **Transit Rule**. Which one is preferred when linear and angular measurements are of equal precision? [7 Marks]

Q.4 (A) Draw the Block Diagram of a Total Station and explain the function of the Microprocessor and Electronic Field Book. [7 Marks]

Q.4 (B) What is Resection in Total Station surveying? Explain the procedure to find the coordinates of an unknown station using Resection. [7 Marks]

Q.5 (A) Define Remote Sensing. Distinguish between Passive and Active Remote Sensing with examples. [7 Marks]

Q.5 (B) Write the procedure to measure a horizontal angle by the Repetition Method. [7 Marks]

Q.6 (A) Explain the Method of Squares (Grid Method) for plotting contours. Where is it used? [7 Marks]

Q.6 (B) What is GIS? Explain the role of Data (Vector vs Raster) in GIS analysis. [7 Marks]

Q.7 Write Short Notes on (Any FOUR): [3.5 \times 4 = 14 Marks]

- (a) Google Maps Application in Civil Engineering
- (b) Lidar vs Radar
- (c) Characteristics of Contours (Hill vs Depression)
- (d) Sources of Errors in GPS
- (e) Plunging the Telescope

Paper 3 Key:

- **MCQ:** (i)b, (ii)d, (iii)b, (iv)b, (v)b, (vi)b, (vii)b.
- **Q3(A) Num:** $V = D \tan \theta = 120 \times \tan(8.5^{\circ}) = 17.93\text{m}$. $RL = 100 + 1.45 + 17.93 = 119.38\text{m.p}$