

GUJARAT TECHNOLOGICAL UNIVERSITY

BE-4 SEMESTER – OLD PAPER – S22 TO W25 – QUESTION BANK

Subject Name & Code: Surveying (3140601)

Module 1 – Plane Table Survey

Repeated Questions:

1. **Explain the principle of plane tabling and describe the orientation of a plane table by the magnetic needle method.**
 - Appeared in: W22 (Q1a, 03 marks), S25 (Q1a, 03 marks), W24 (Q1a, 03 marks)
2. **Enlist various methods of plane tabling and explain any one in detail.**
 - Appeared in: W25 (Q1c, 07 marks), W24 (Q3c, 07 marks), S23 (Q3b, 04 marks)
3. **Explain temporary adjustments of theodolite.**
 - Appeared in: W25 (Q1b, 04 marks), W24 (Q1c, 07 marks), W23 (Q1c, 07 marks), S23 (Q1c, 07 marks)

Other Important Questions:

1. **Explain any three instruments of plane table survey with sketch.**
 - Appeared in: W24 (Q1a, 03 marks)
 2. **List out various methods for the orientation of a plane table and explain any one with figure.**
 - Appeared in: W23 (Q1a, 03 marks)
 3. **Explain orientation of plane table by backsighting with figure.**
 - Appeared in: S23 (Q3a, 03 marks)
 4. **List the instruments used in plane tabling and give their uses.**
 - Appeared in: S22 (Q1a, 03 marks)
 5. **State sources of errors during plane tabling / Explain various sources of errors in plane tabling.**
 - Appeared in: S23 (Q1a, 03 marks), S22 (Q1b, 04 marks)
 6. **What are the advantages and disadvantages of plane table surveying?**
 - Appeared in: W25 (Q3a, 03 marks), S25 (Q3a, 03 marks), W24 (Q5b, 04 marks), W23 (Q3a, 03 marks)
 7. **In plane table survey at one plane table station it was found that the table was not accurately centered over the ground station. If the displacement was 40 cm in a direction at right angles to the ray. Calculate the displacement of the point from its true position on the plane table sheet if the scale of plotting is, (1) 1cm=50cm (2) 1:500 and (3) 1cm=50m.**
 - Appeared in: W22 (Q3a, 03 marks)
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Module 2 – Theodolite Traversing

Repeated Questions:

1. **Explain the methods of theodolite traversing. Explain any one with figure.**
 - Appeared in: W22 (Q1c, 07 marks), S23 (Q1c, 07 marks)
2. **Define: Face left, Transiting, Line of Collimation, Axis of telescope, etc.**
 - Appeared in: W23 (Q2c, 07 marks), W24 (Q3b, 04 marks), S25 (Q1c, 07 marks)
3. **Find the magnitude and direction of closing error in a given traverse.**
 - Appeared in: W24 (Q2c, 07 marks), W22 (Q2c, 07 marks), S23 (Q2c, 07 marks)

Other Important Questions:

1. **State different methods of measurement of horizontal angle using theodolite and explain any one method.**
 - Appeared in: W24 (Q2a, 03 marks)
 2. **Explain measurement of horizontal angle by repetition method using theodolite.**
 - Appeared in: W25 (Q2c, 07 marks)
 3. **Which are the methods of measuring horizontal angles? Briefly describe repetition method.**
 - Appeared in: S22 (Q2b, 04 marks)
 4. **Explain Gale's traverse table.**
 - Appeared in: W25 (Q3c, 07 marks)
 5. **How will you check the accuracy of closed and open traverse?**
 - Appeared in: S25 (Q2c, 07 marks)
 6. **Explain closing error in theodolite traverse with sketch and write formula for relative error of closure.**
 - Appeared in: S22 (Q2c, 07 marks)
 7. **Length and Bearings for a closed traverse ABCD are given. Determine length and bearing of line DA.**
 - Appeared in: S22 (Q2c, 07 marks)
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Module 3 – Trigonometric Levelling

Repeated Questions:

1. **An instrument was set up at A and the angle of elevation of the top of an electric pole BC was given. Determine RL of top of pole.**
 - Appeared in: W25 (Q5c, 07 marks), W24 (Q2c, 07 marks), S23 (Q3a, 03 marks), W22 (Q3a, 03 marks)
2. **Derive expressions for horizontal distance and elevation when base is inaccessible and instrument axes at same level.**
 - Appeared in: W23 (Q2c, 07 marks), W22 (Q2c, 07 marks), S25 (Q5c, 07 marks)

Other Important Questions:

1. **Two stations A and B, 80 km apart, have elevations 16 m and 272m above mean sea level respectively. Calculate the minimum height of the signal at B.**
 - Appeared in: S23 (Q3c, 07 marks), W22 (Q3c, 07 marks)
 2. **Why Trigonometric levelling is an indirect method of levelling?**
 - Appeared in: W23 (Q3a, 03 marks)
 3. **What is trigonometric levelling? What are its advantages and disadvantages over direct levelling?**
 - Appeared in: S25 (Q3a, 03 marks)
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Module 4 – Curves

Repeated Questions:

1. **What is transition curve? Why and where it is provided? / State requirements of transition curve.**
 - Appeared in: W25 (Q3b, 04 marks), W24 (Q4a, 03 marks), S22 (Q4a, 03 marks), W23 (Q4a, 03 marks)
2. **Differentiate between Fixed Hair Method and Movable Hair Method.**
 - Appeared in: W25 (Q2b, 04 marks), W24 (Q4b, 04 marks), W23 (Q5c, 07 marks)
3. **Calculate elements of a simple circular curve (tangent length, long chord, curve length, chainage, apex distance, etc.).**
 - Appeared in: W25 (Q2c, 07 marks), S24 (Q4c, 07 marks), S22 (Q4c, 07 marks)

Other Important Questions:

1. **Explain in brief vertical curves.**
 - Appeared in: W25 (Q4b, 04 marks)
2. **Draw a neat sketch of a simple circular curve / with all its elements.**
 - Appeared in: S25 (Q4a, 03 marks), W23 (Q5a, 03 marks)
3. **Define: Back Tangent, Point of Intersection, Angle of Deflection, etc.**
 - Appeared in: W24 (Q3a, 03 marks)
4. **Define: Point of curvature, length of curve, sub-chord, right-hand curve.**
 - Appeared in: W22 (Q5b, 04 marks)
5. **Explain elements of a reverse curve with figure.**
 - Appeared in: W22 (Q4a, 03 marks)
6. **What is reverse curve? Draw a neat sketch showing elements of a reverse curve.**
 - Appeared in: S23 (Q5a, 03 marks)
7. **Draw a figure of a compound curve with all its elements.**
 - Appeared in: S25 (Q5a, 03 marks)
8. **A compound curve, consisting of two simple circular curves of radii 350 m and 450 m, is to be laid out between two straights. Calculate various elements.**
 - Appeared in: W22 (Q4c, 07 marks)
9. **Explain the field procedure for setting out a combined curve.**
 - Appeared in: S25 (Q4c, 07 marks)
10. **Define transition curve, compound curve and reverse curve.**
 - Appeared in: W24 (Q5a, 03 marks)

Module 5 – Areas and Volumes

Repeated Questions:

1. **Differentiate between Trapezoidal rule and Simpson's rule.**
 - Appeared in: W24 (Q3b, 04 marks), W23 (Q4b, 04 marks), S25 (Q4b, 04 marks)
2. **Calculate area between survey line and curved boundary using Trapezoidal and Simpson's rule.**
 - Appeared in: W25 (Q4c, 07 marks), S23 (Q4c, 07 marks), S22 (Q5c, 07 marks)
3. **Explain measurement of area by using planimeter / How to find area of irregular figure with planimeter.**
 - Appeared in: W25 (Q4b, 04 marks), W23 (Q4c, 07 marks), S25 (Q4c, 07 marks)

Other Important Questions:

1. **Explain with figure the Mid-ordinate rule method of computation of area.**
 - Appeared in: W24 (Q3a, 03 marks)
 2. **Derive an equation for calculating area by Mid-ordinate rule and Average-ordinate rule.**
 - Appeared in: W22 (Q4b, 04 marks)
 3. **Determine area between chain line and irregular boundary by mid-ordinate rule and average ordinate rule.**
 - Appeared in: W24 (Q5c, 07 marks)
 4. **Enumerate different rules used for calculation of area and discuss in detail Simpson's one third rule.**
 - Appeared in: S22 (Q3c, 07 marks)
 5. **Discuss how reservoir capacity is determined.**
 - Appeared in: W24 (Q3b, 04 marks), S23 (Q4b, 04 marks)
 6. **Area enclosed between dam and upstream contours at a reservoir site are given. Determine capacity by trapezoidal and prismoidal formula. Also compute prismoidal correction.**
 - Appeared in: W22 (Q4c, 07 marks)
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Module 6 – Tacheometric Surveying

Repeated Questions:

1. **Explain in brief purposes / principle of tacheometry.**
 - Appeared in: W25 (Q1a, 03 marks), W23 (Q2a, 03 marks), W22 (Q2a, 03 marks), S22 (Q4a, 03 marks)
2. **Explain in brief instruments used in tacheometry.**
 - Appeared in: W25 (Q3b, 04 marks), W24 (Q4a, 03 marks)
3. **Derive expression for horizontal and vertical distances in fixed hair method when staff is held vertically and line of sight is inclined.**
 - Appeared in: W23 (Q5c, 07 marks), W22 (Q5c, 07 marks), S23 (Q5c, 07 marks), S22 (Q4c, 07 marks)

Other Important Questions:

1. **Differentiate between stadia hair method and tangential method.**
 - Appeared in: S25 (Q2b, 04 marks), S23 (Q2a, 03 marks)
 2. **The following readings were taken with a tacheometer. Calculate tacheometric constant.**
 - Appeared in: W25 (Q3c, 07 marks)
 3. **In tacheometric survey, derive expression for horizontal and vertical distances when line of sight is horizontal and staff is vertical.**
 - Appeared in: S23 (Q5c, 07 marks)
 4. **What are the different errors in tacheometry? What are permissible errors?**
 - Appeared in: S25 (Q2c, 07 marks)
 5. **Write short note on anallactic lens.**
 - Appeared in: S25 (Q5b, 04 marks)
 6. **To determine distance between two stations A and B, a tacheometer was set up at P. Calculate horizontal distance AB and RL of B.**
 - Appeared in: S23 (Q5c, 07 marks)
 7. **A tacheometer was set up on station A. Calculate horizontal distance AB and RL of B.**
 - Appeared in: W22 (Q5c, 07 marks)
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Module 7 – Geodetic Surveying

Repeated Questions:

1. **Differentiate between plane surveying and geodetic surveying.**
 - Appeared in: W25 (Q3a, 03 marks), S25 (Q5b, 04 marks), S23 (Q2b, 04 marks), S22 (Q3a, 03 marks)
2. **Explain principle and uses of triangulation.**
 - Appeared in: W23 (Q2b, 04 marks), W22 (Q2b, 04 marks)
3. **What is base line? How is it selected?**
 - Appeared in: W25 (Q5a, 03 marks), S22 (Q3c, 07 marks)

Other Important Questions:

1. **Discuss selection of triangulation station.**
 - Appeared in: W25 (Q4a, 03 marks)
 2. **What do you mean by strength of figure in triangulation work?**
 - Appeared in: S22 (Q3b, 04 marks)
 3. **Which are various equipment used for measurement of a baseline? Explain Hunter's short base method.**
 - Appeared in: S25 (Q3c, 07 marks)
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Module 8 – Theory of Errors & Modern Surveying Instruments

Repeated Questions:

1. **Define / Differentiate: Direct observations, Indirect observations, Most Probable Value, Most Probable Error.**
 - Appeared in: W25 (Q5b, 04 marks), W24 (Q5b, 04 marks), W22 (Q5b, 04 marks), S23 (Q5b, 04 marks)
2. **Enlist various laws of weight / rules for giving weights to field observations.**
 - Appeared in: W25 (Q4a, 03 marks), S25 (Q5a, 03 marks)
3. **Explain electromagnetic spectrum.**
 - Appeared in: W25 (Q5a, 03 marks), S25 (Q1b, 04 marks), S22 (Q5a, 03 marks)

Other Important Questions:

1. **Explain in brief various types of errors in surveying instruments.**
 - Appeared in: W25 (Q5b, 04 marks)
2. **Differentiate between cumulative errors and compensating errors.**
 - Appeared in: S23 (Q4b, 04 marks)
3. **What do you mean by Gross errors, Systematic errors, Accidental errors, Residual errors?**
 - Appeared in: W23 (Q5b, 04 marks)
4. **Explain the working principle of GPS / What are segments of GPS?**
 - Appeared in: W24 (Q4c, 07 marks), S23 (Q3c, 07 marks), S22 (Q5b, 04 marks)
5. **Explain in detail total station giving its uses and applications.**
 - Appeared in: W25 (Q5c, 07 marks), W24 (Q1b, 04 marks), S23 (Q1b, 04 marks), S22 (Q5c, 07 marks)
6. **Write short note on Electronic Digital Theodolite.**
 - Appeared in: W24 (Q4a, 03 marks)
7. **What is GPS? Give its uses and application.**
 - Appeared in: S22 (Q5c, 07 marks)
8. **What is GIS? Discuss components of GIS.**
 - Appeared in: S22 (Q5b, 04 marks)
9. **Explain basic principle of EDM.**
 - Appeared in: S22 (Q5a, 03 marks), W22 (Q1b, 04 marks)
10. **How to calculate probable error in measurements from probability curve of errors?**
 - Appeared in: S25 (Q5c, 07 marks)
11. **Write equation to determine probable error of single measurement and Mean Square Error.**
 - Appeared in: W23 (Q5a, 03 marks)
