

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject Code: 2130601****Date: 20-12-2014****Subject Name: Surveying****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) What is the characteristics of plane tabling ? What are the advantages and disadvantages of Plane table surveying ? **07**

(b) Explain method of Intersection and Traversing for plane tabling. **07**

Q.2 (a) Define (i) Swinging (ii) Line of collimation (iii) Temporary adjustment of theodolite (iv) Plunging (v) Telescope Normal (vi) Centering (vii) Vertical axis **07**

(b) Illustrate with an example in a tabular format about Repetition method of measurement of horizontal angle with the help of a theodolite. **07**

OR

(b) Define closing error and Balancing of Traverse. **07**

The survey data of a traverse are given in table below. The length and bearing of line DA were not recorded during survey. Find the missing measurements.

Line	Length (m)	Bearing
AB	201.8	N 45° 00' W
BC	288.4	N 60° 30' W
CD	192.6	S 34° 45' W
DA	?	?

Q.3 (a) Define Trigonometric leveling. Derive the equation to find out the elevation of the object, if the base of the Object is inaccessible, the instruments stations and elevated object are in the same vertical plane and instrument axes are at the same level. **07**

(b) Two straight AB and BC intersect at a chainage of 4242.0 m. The deflection angle is 40° and radius of curve is 344 m. Calculate, **07**

- i. Tangent length ii. Length of curve iii. Chainage of point of Curve
- iv. Chainage of Point of tangency v. Length of Long chord
- vi. Degree of curve and vii. Apex distance.

OR

Q.3 (a) To determine the height of a mobile tower, a theodolite was kept at two stations P and Q, 150 m apart, P being nearer to tower. The readings at the bench mark (of RL 555.055m) were 1.15 m from station P and 2.05 m from station Q. The vertical angles to the top of the tower were 17° 15' and 8° 40' from station P and Q respectively. Find the horizontal distance and RL of top of the mobile tower. **07**

(b) Calculate perpendicular offsets at 20 m. interval from centre on either side to set out a simple circular curve of 280 m. radius and deflection angle is 60°. **07**

Q.4 (a) Illustrate with an example about different rules to calculate boundary area. **07**

(b) (i) Derive relationship between Degree and Radius of curve by Chord Definition **03**

(ii) Explain method of coordinates to find out area **04**

OR

- Q.4 (a)** A single-level section has a formation width of 7.5 m. and side slopes 2:1. The depth of cutting at the centre at every 30 m. intervals are 1.8, 2.175, 2.55, 2.925, and 3 m. Find the volume of earthwork in the length of 120 by Trapezoidal formula and Prismoidal formula. **07**
- (b)** (i) Define (1) Mid Ordinate (2) Apex distance (3) Length of chord **03**
(ii) Explain Zero circle of planimeter **04**
- Q.5 (a)** (i) Differentiate between Plain Trigonometric Levelling and Geodetic Trigonometric Levelling **04**
(ii) List and explain different types of transition curves **03**
- (b)** i. Explain the procedure for setting out the foundation plan for a residential building **04**
ii. Define sounding. For which purposes sounding is required? **03**
- OR**
- Q.5 (a)** (i) An instrument was setup at A and the angle of elevation of the top of an electric pole BC was $31^{\circ} 20'$. The horizontal distance between A and B, the foot of the pole was 378.80 m. Determine the RL of top of the pole C, if the staff reading held on a BM (RL 180.0) was 3.145 m. with telescope in horizontal plane. **03**
(ii) What is the procedure to find out area with the help of a Planimeter ?
- (b)** i. Explain the procedure for determining the length of a bridge for setting out piers. **04**
ii. Explain the procedure for sounding with the help of an Echo sounder. **03**
