

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 140601****Date: 22-12-2014****Subject Name: Advanced 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 are the purposes of tacheometric surveying? **03**
 (b) Explain stadia method of techeometry. **04**
 (c) The following observations were made using a tacheometer fitted with an anallatic lens, the multiplying constant being 100 and additive constant is 0 and the staff held vertically **07**

Inst. Station.	Height of Inst.	Staff station	WCB	Vertical angle	Hair readings	Remarks
O	1.550	A	30° 30'	4° 30'	1.155, 1.755, 2.355	RL of O
		B	75° 30'	10° 15'	1.250, 2.000, 2.750	= 150.00

Calculate the distance AB and the RLs of A and B. Find also the gradient of the line AB.

- Q.2** (a) What is triangulation? Explain principle of triangulation. **07**
 (b) Explain with sketches different triangulation figures. **07**

OR

- (b) What is satellite station? Discuss the method of reduction of horizontal angle to center. **07**

- Q.3** (a) Define: Direct observation, conditioned quantity, true value, true error, most probable error, residual error, and observed equation. **07**
 (b) Two triangulation stations A and B are 50 kilometers apart and have elevations 235 m and 250 m respectively. Find the minimum height of signal required at B so that the line of sight may not pass near the ground 3 meters. The intervening ground may be assumed to have uniform elevation of 200 meters. **07**

OR

- Q.3** (a) What is weight of a quantity? Discuss various laws of weights. **07**
 (b) Adjust the following angles closing the horizon: **07**

$$A = 112^{\circ} 20' 47'' \quad \text{wt. 2}$$

$$B = 90^{\circ} 30' 15'' \quad \text{wt. 3}$$

$$C = 58^{\circ} 12' 05'' \quad \text{wt. 1}$$

$$D = 98^{\circ} 57' 01'' \quad \text{wt. 4}$$

- Q.4** (a) Define: Zenith, nadir, horizon, prime vertical, celestial poles, vertical circle, and ecliptic. **07**
 (b) Prove that altitude of pole is equal to latitude of observer. **07**

OR

- Q.4** (a) Explain the scale of vertical photographs. **07**

- (b) Calculate height of microwave tower appearing in a vertical photograph. The distance of the tower in photograph from principal point is 6.03 cm and relief displacement measured is 0.603 cm. the datum scale of photo is $\frac{1}{11000}$ and the focal distance of camera $f = 20$ cm. **07**

- Q.5 (a) Explain components of remote sensing. **07**
(b) Explain the interaction of EM energy with earth surface features. **07**

OR

- Q.5 (a) Define GIS. Explain the objectives of GIS. **07**
(b) Discuss the application of GIS in civil engineering discipline. **07**
