Seat No.: _____ Enrolment No._____

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 tacheometic 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 = 150.00
		B	75˚ 30’	10˚ 15’	1.250,2.000,2.750	

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 valve, 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˚ 20’ 47 " wt. 2
B = 90˚ 30’ 15 " wt. 3
C = 58˚ 12’ 05 " wt. 1
D = 98˚ 57’ 01 " 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**

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