Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV • EXAMINATION – SUMMER 2015

Subject Code: 140601 **Date: 01/06/2015**

Subject Name: Advanced Surveying

Time: 10.30am-01.00pm **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)** Derive the expression for horizontal and vertical distances in fixed hair method, when the staff is held vertically and measured angle is that of elevation .Also find R. L. of staff station. **07**

(b) To determine elevation of station P and Q in a tacheometer survey, the following observations were with the staff held vertical. The instrument was fitted with an analytical lens and having multiplying constant was 100. Calculate R.L. of station P, Q and horizontal distances PQ and OQ. **07**

Instrument Station	H.I. (m)	Staff Station	Vertical angle	Staff reading (m)			Remark
O	1.35	B.M.	- 6° 00′	1.335	1.895	2.460	R.L. of B.M. is 240 m
O	1.35	Q	+ 8° 30′	0.780	1.265	1.745	
P	1.30	Q	- 6° 30′	1.155	1.615	2.075	

Q.2 **(a)** Define following terms: **07**

(1) Direct observations (2) Independent quantity (3) Zenith and Nadir
(4) Horizon (5) Normal equation (6) Celestial sphere (7) Most probable value.

(b) (i) Describe method of determine tacheometer constants in field. **03**

(ii)Differentiate between stadia hair method and tangential method. **04**

OR

(b) Prove that altitude of pole is equal to latitude of observer. **07**

Q.3 **(a)** Determine the most probable values of A, B and C from the following observations of equal weights. The angle fulfill the condition A + B = C. **07**

A = 40° 20′ 15″, B = 20° 25′ 16″, C = 60° 35′ 45″

(b) Describe procedure of site selection and extension of base line by prolongation in triangulation. **07**

OR

Q.3 **(a)** Classify aerial photographs and write a brief note on “Aerial camera”. **07**

(b) Enumerate uses of triangulation and write brief note on Grid iron system and central system of triangulation. **07**

Q.4 **(a)** What is relief displacement? Derive an expression for the relief displacement in a vertical photograph **07**

(b) Explain basic principal of EDM. Discuss electromagnetic spectrum with neat sketch. **07**

OR

Q.4 **(a)** The scale of aerial photograph is 1 cm = 200 m. The size of photograph is 25 cm x 25 cm. Determine the numbers of photographs required to cover an area of 250 km x 150 km and 525 km^2, if the longitudinal lap is 60% and side lap is 30%. **07**

	(b)	Enumerate different types of EDM instruments and describe briefly a Total station.	**07**
Q.5	**(a)**	Explain energy interaction with earth surface features.	**07**
	(b)	Define GIS. Enlist key components of GIS and give application of GIS in civil engineering.	**07**

OR

Q.5	**(a)**	Write short note on “Global positioning system”.	**07**
	(b)	Classify GIS data with suitable examples. Discuss integration of remote sensing and GIS.	**07**

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