Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. Sem-IV Examination June- 2011

Subject code:140601

Subject Name: Advanced Surveying

Date:06/06/2011 **Time: 10.30 am – 01.00 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)** Derive the expression for the horizontal and vertical distances in the fixed hair method when the staff is held vertically and the measured angle is that of elevation. **07**

(b) The following observations were taken using a tacheometer fitted with an anallatic lens, the staff being held vertically. The constant of tacheometer is 100. **07**

Inst. st.	Height of axis	Staff station	Vertical angle	Hair readings	Remarks
P	1.45	B.M	$-6^0\ 12'$	0.98,1.54,2.10	R.L of B.M =384.25 m
P	1.45	Q	$+7^0\ 5'$	0.83,1.36,1.89	
Q	1.57	R	$+12^0\ 21'$	1.89,2.48,3.07	

Determine the distances PQ and QR and the R.Ls of P,Q and R

Q.2 **(a)** Define weight of an observed quantity. Discuss various laws of weights. **07**

(b) Define accidental error, true value, direct observation, conditioned quantity, most probable value, true error, normal equation. **07**

OR

(b) Determine the most probable values of the angles of a triangle ABC, given by the following data. **07**

$<A = 62^0\ 14'\ 12''$ Weight = 1

$<B = 48^0\ 12'\ 14''$ Weight = 3

$<C = 69^0\ 33'\ 28''$ Weight = 2

Q.3 **(a)** What is relief displacement? Derive an expression for the relief displacement in a vertical photograph. **07**

(b) A line AB measures 11.00 cm on a photograph taken with a camera having a focal length of 21.5 cm. The same line measures 3 cm on a map drawn to scale of 1/45000. Calculate the flying height of the aircraft, if the average altitude is 350 m. **07**

OR

Q.3 **(a)** Define celestial sphere, zenith, nadir, vertical circles, latitude, longitude, azimuth **07**

(b) Determine the azimuth and altitude of a star from the following data. **07**

Latitude of the observer = 48^0 N

Hour angle of star = 43^0

Declination of star = $18^0\ 20'$ N

Q.4 **(a)** What is triangulation? What are the factors that affect the selection of triangulation stations? **07**

(b) Explain the extension of base with neat sketch. **07**

OR

Q.4	**(a)**	Explain the basic principle of EDM. Write a brief note on Electromagnetic spectrum.	**07**
	(b)	Write a short note on Total station.	**07**
Q.5	**(a)**	Define remote sensing. Enlist types of remote sensing. List the applications of remote sensing.	**07**
	(b)	Write a short note on Global Positioning System.	**07**

OR

Q.5	**(a)**	Define GIS. Enlist key components of GIS. Explain applications of GIS in civil engineering.	**07**
	(b)	Write short note on Geospatial analysis.	**07**

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