Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – WINTER 2017

Subject Code: 2140601 **Date:21/11/2017**

Subject Name: Advanced Surveying

Time: 02:30 PM TO 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.**

			MARKS
Q.1*	**(a)**	What arrangement make K=100 and C=0 in techeometer.	**03**
	(b)	Explain with examples any four laws of weight	**04**
	(c)	Discuss the methods of techeometry and derive the distance and elevation formulae used in techeometry for staff held vertical and line of sight horizontal.	**07**
Q.2	**(a)**	Define (i) Principal point (ii) Nadir (iii)Zenith	**03**
	(b)	Differentiate different types of triangulation systems	**04**
	(c)	What are selection criteria of triangulation station? Find out minimum height of signal required at B so that the line of sight may not pass near the ground than 2.0 m if A and B two stations are 60 km apart and have elevations 240 m and 280 m respectively. Ground may be assumed to have uniform level of 200 m	**07**
		OR	
	(c)	Why overlap is necessary in photogrammetry? Determine number of photographs required to cover an area of 100 sq. km if longitudinal lap is 60% and side lap is 30%. Scale of an aerial photograph is 1 cm= 100 m and photograph size is 20 cm x 20 cm.	**07**
Q.3	**(a)**	Define base line and discuss its selection criteria	**03**
	(b)	Define (i) celestial sphere (ii) celestial horizon (iii) terrestrial equator (iv) vertical circle	**04**
	(c)	Compute the horizontal distance PA and RL of point A for staff held vertically for below observations taken by techeometer.BM=100 m , K=100 and C=0	**07**

Inst. Station	Staff point	Vertical angle	Staff readings
P	BM	-6^o	1.360, 1.915, 2.470
	A	$+5^o$	1.065, 1.885, 2.705

		OR	
Q.3	**(a)**	Define (i) Drift (ii) Latitude (iii) Departure	**03**
	(b)	Derive the equation for relief displacement	**04**
	(c)	Following readings are taken by theodolite	**07**

Angle	Weight	Angle	Weight	Angle	Weight
40^o 20’ 20”	2	40^o 20’ 18”	2	40^o 20’ 19”	3

Calculate(i) Probable error for single measurement for unit weight(ii) Probable error for single observation of weight 3(iii) Probable error of weighted arithmetic mean

Q.4	**(a)**	State salient features of tangential method	**03**
	(b)	Differentiate (i) Luminous and non- luminous signals (ii) Systematic errors and accidental errors	**04**
	(c)	What is the principle of least square? Prove it	**07**

OR

Q.4	**(a)**	Emphasis on use of GPS for public use	**03**
	(b)	Give the classification of EDM instruments	**04**
	(c)	What is energy interaction in remote sensing? Describe the energy interaction with earth surface features.	**07**
Q.5	**(a)**	Differentiate active and passive remote sensing.	**03**
	(b)	State the merits and demerits of GIS	**04**
	(c)	Define image interpretation and describe different elements of visual image interpretation.	**07**

OR

Q.5	**(a)**	Explain the working principle of GPS.	**03**
	(b)	Differentiate transit theodolite with total station	**04**
	(c)	Discuss all components of GIS and explain the use of GIS in the field of civil engineering	**07**

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