GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 3134003   **Date: 28/11/2019**

Subject Name: Geomatics Engineering

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)**	Enlist the methods for the measurement of horizontal angle with theodolite? Explain any one with sketch.	**03**
	(b)	Discuss with necessary sketch, the various methods of orientation of plane table.	**04**
	(c)	A traverse survey was done near NH48 at Gandhinagar. Observations are given in below table. Was it free from closing error? If not, find the magnitude & direction of the closing error.	**07**

Line	OP	PQ	QR	RO
Length (m)	314.8	361.6	471.8	407
Bearing	$81^0 24'$	$149^0 49'$	$252^0 52'$	$359^0 59'$

Q.2	**(a)**	If a curve is designated as a 4^0 curve on a 30m arc, find the tangent distance, length of long chord, length of arc, apex distance, and mid-ordinate if the deflection angle is 36^0.	**03**
	(b)	Explain with sketch the Two point problem in Plane Table Surveying.	**04**
	(c)	Four angles are measured at a station closing the horizon. The values of the angles are A= $102^0 45'51''$ (weight = 3), B = $85^0 42'37''$ (weight = 2), C = $108^0 36'47''$ (weight = 4), and D= $62^0 51'50''$ (weight = 1). Find the probable values of these angles.	**07**

OR

	(c)	Due to some problems with the equipment, the bearings of two sides were not taken for a closed traverse ABCDA. From the available data, compute the bearings of two sides.	**07**

Line	AB	BC	CD	DE	EA
Length (m)	230.5	250.2	210.8	240.3	265.4
Bearing	$N36^0 45'E$	$S82^0 48'E$	$S10^0 15'E$	Missing	Missing

Q.3	**(a)**	Write a short note on Most Probable Value.	**03**
	(b)	Briefly explain: Well-conditioned triangle, Eccentric station, Satellite station, Plunging of theodolite	**04**

(c)	Points P and Q have elevations of 600 m and 300 m respectively. The photographic coordinates of points P and Q were measured as P (35, 25) and Q (20, 50) in millimeters. The photograph was taken with a camera having a focal length of 210 mm and from an altitude of 2500m. Find the length of line PQ.		**07**

OR

Q.3	**(a)**	Write a short note on Lunar Tides.	**03**
	(b)	What do you understand bt "Hydrographic Sueveying"? Also give its application in various areas of civil engineering.	**04**
	(c)	It was required to determine the distance between two points A and B by tacheometer fitted with anallatic lens (K=100, C=0) with the instrument at A and staff at B, the observations made were at vertical angle +9°46' and staff intercepts of 1.915 m. What is the horizontal distance AB? Later on it was found that the constants of intrument were 97.97 and .05. What would by the percentage error in the horizontal distance computed?	**07**
Q.4	**(a)**	What is Tilt and Drift in Aerial photogrametry? Explain with sketch.	**03**
	(b)	Explain components of total station with neat sketch.	**04**
	(c)	Write short notes on the following: i) Lead line ii) Sounding machine	**07**

OR

Q.4	**(a)**	What do you understand by "Remote Sensing"? Differentiate between active and passive remote sensing.	**03**
	(b)	Two stations A and B are 72km apart. The elevation of the station A and B are 372m and 418m, respectively. The intervening ground has a uniform elevation of 328m. The line of sight is 3m above the ground. At what distance the line of sight from A will strike the ground? What would be the height of the signal on B?	**04**
	(c)	Explain with sketch various systems of Triangulation.	**07**
Q.5	**(a)**	Define and explain working principle of EDM.	**03**
	(b)	What do you understand by "Horizontal substance method"? Derive the expression for horizontal distance.	**04**
	(c)	Explain with sketch the method of setting out of a circular curve by Offsets or Ordinates from the long chord.	**07**

OR

Q.5	**(a)**	What is LIDAR? Explain its application in detail.	**03**
	(b)	The horizontal distance between two stations P and Q is 8254m. The following data was recorded: Vertical angle from P to Q = -54'34", vertical angle from Q to P = -1^{0}23'34", Height of instrument at P = 1.25m, height of instrument at Q = 1.32m, height of signal at P = 3.54m, height of signal at Q = 4.56m. Find the difference in level between the two stations.	**04**
	(c)	Explain with sketch. How would you set out a foundation plan of 5m x 6.5m room in a 10m x 8m size plot? Assume brick masonry wall of 0.3m thickness.	**07**

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