Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 2134003 **Date: 3/12/2019**

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)** What is balancing of traverse? Enlist methods of same. **03**

(b) Figure out the R.L. of the top of a chimney from following data. **04**

Instrument Station	Reading on B.M.	Angle of Elevation	Remarks
A	0.765	15°47’	R.L. of BM = 750.000 m
B	2.117	$07^0$30’	Distance AB = 50 m

(c) What do you understand by Tangential method of Tacheometry? Derive formulae of horizontal distance (D) and Elevation (V) for three cases of Tangential method. **07**

Q.2 **(a)** What is called face left and face right related to theodolite? **03**

(b) Write short notes on the Well conditioned triangle. **03**

(c) Find out the R.L. of stations P & Q. Also find the elevation difference between both the stations and gradient of line PQ from the data given below. Take K = 100, C = 0.3 for tacheometry survey. **08**

Instrument at	Staff Station	Vertical Angle	Stadia Readings
A	P	+ $2^0$39’	1.455, 2.695, 4.035
	Q	- $1^0$30’	2.685, 3.360, 4.035

OR

(c) Prepare Gale’s Traverse Table to adjust closing error of clockwise traverse for following data **08**

Line	AB	BC	CD
Length (m)	232	212	174
WCB	100^0	250^0	342^0

Q.3 **(a)** Explain method of repetition for measurement of angles in theodolite survey. **03**

(b) What are the temporary adjustments of a theodolite? Explain in brief. **04**

(c) How would you set out a 6m x 7.5m room in a 10m x 8m size plot? Explain with sketch. **07**

OR

Q.3 **(a)** What are the capabilities of a Total Station? Enlist them. **03**

(b) How is the closing error of a traverse adjusted graphically? **04**

(c) Find out the magnitude and direction of closing error (if any) for the observations given in following table of Traverse Survey. **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.4 **(a)** What do you understand by EDM? **03**

(b) Explain with sketch, the working of Drone survey. **05**

(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 100.1 and .08. What would by the percentage error in the horizontal distance computed? **06**

OR

Q.4 **(a)** Determine the horizontal distance between theodolite station and 6m long horizontal substance bar perpendicular to line of sight when the included angle is 53'. **03**

(b) What is basic principle of stadia? Derive the formula of distance measurement (Fixed hair stadia method) with horizontal line of sight. **04**

(c) Explain with sketch Systems of Triangulations. **07**

Q.5 **(a)** Define and explain working principle of EDM. **03**

(b) Derive the formulas for finding the Distance and Elevation of an inaccessible object by Trigonometric levelling when instrument stations are not in the same plane. **05**

(c) Define following terms **06**

a) Plunging b) Swinging c) Strength of figure d) Satellite station e) First order triangulation f) Reduction of centre

OR

Q.5 **(a)** Briefly discuss the significance and types of "Trigonometric Levelling". **03**

(b) Derive the formulas for finding the Distance and Elevation of an inaccessible object by Trigonometric levelling when instrument stations are in the same plane. **05**

(c) Find the area of the closed traverse by coordinate method for the following data: **06**

Line	Northing	Southing	Easting	Westing
OP		160.60	152.80	
PQ	211.50		50.50	
QR	188.90			92.4
RO		230.30		109

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