Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2130601 **Date: 04/06/2019**

Subject Name: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.**

Q.1 **(a)** State the principle of plane tabling **03**

(b) Which are the methods of plane tabling? Explain any two in detail. **04**

(c) ABCD is a closed traverse in which the bearing of DA has not been observed. The rest of the field record is as follows: Find the bearing of line DA **07**

Line	Length	Bearing
AB	235.10	338° 20'
BC	317.40	82° 22'
CD	215.00	167° 00'
DA	285.21	?

Q.2 **(a)** Enumerate the method to find RL of instrument axis when base of the object is accessible **03**

(b) Which are the methods of measuring horizontal angles? Briefly describe repetition method **04**

(c) Explain the temporary adjustments of theodolite **07**

OR

(c) Which are the methods of traversing? Explain fast angle method and loose needle method in detail **07**

Q.3 **(a)** What is basic principle of trigonometric levelling and the difference between plane and geodetic methods **03**

(b) A theodolite was set up at a distance of 140 m from tower. The angle of elevation to the top of the parapet was 11° 8' while the angle of depression to the foot of the wall was 2° 12'. The staff reading on the BM of RL 60.25 with telescope horizontal was 0.880. Find the height of the tower and the RL of the top of the parapet **04**

(c) Derive the expression for computing horizontal distance and elevation in trigonometric levelling while base of the object is inaccessible and instrument stations are in same vertical plane with the elevated object for the instrument axes at (i) same level and (ii) different levels **07**

OR

Q.3 **(a)** Explain horizontal curve **03**

(b) Two straights intersect at chainage 3000 m and the angle of intersection is 120°. If the radius of the simple curve to be introduced is 600 m, find the following:
(I) Tangent distance
(ii) Chainage of the point of commencement
(iii) Length of the long chord **04**

(c) Draw the sketch explaining elements of simple circular curve. Define: Point of intersection, angle of deflection, point of curvature, tangent distance, long chord, mid ordinate, external distance **07**

Q.4 **(a)** What is transition curve? State the requirements of a transition curve. **03**

(b) How would you find out weather the vertical curve will have convexity upwards or downwards if the gradients on the two sides of the apex are given? **04**

(c) The following offsets were taken at 10 m intervals from a survey line to an irregular boundary line. **07**

2.50,4.40,6.60,5.50,7.40,8.70,7.80,6.50,4.30,3.20

calculate the area enclosed between the survey line, the irregular boundary line and the first and last offsets by

(i) The trapezoidal Rule

(ii) Simpson's Rule

OR

Q.4 **(a)** The area of irregular figure was measured with a planimeter having the anchor point outside the figure. The initial and final readings were 5.835 and 9.354 m respectively. The zero mark of the dial didn't passed index mark during the measurement. The tracing arm was get to the natural scale (M = 100 square cm) . The scale of the map was 1 cm = 10 m. Find the area of the figure **03**

(b) Which are the methods of measurement of area by offset from baseline? Explain mid ordinate and average ordinate rule. **04**

(c) Find the area of the closed traverse having the following data, by the coordinate method. **07**

Line	Latitude	Departure
PQ	+215.50	+110.50
QR	-235.00	+220.00
RS	-160.50	-120.50
SP	+180.00	-210.00

Q.5 **(a)** The area enclosed by the contours in a reservoir are as follows: **03**

The top water level is 195 m and the lowest point in the reservoir is 175 m. Find the volume of water (reservoir capacity) between the contours 175 m and 195 m by

(I) The trapezoidal formula and

(ii) The prismoidal formula

Contour (m)	175	180	185	190	195
Area (m2)	460	750	2500	3500	3950

(b) Explain the method of finding volume by prismoidal formula **04**

(c) What is planimeter? Explain the components and use of it **07**

OR

Q.5 **(a)** Describe horizontal control in Hydrography **03**

(b) Which are the instruments used for taking soundings? Explain Shore signals and buoys in detail **04**

(c) Write a short note on setting out a building **07**

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