Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III • EXAMINATION – SUMMER 2013

Subject Code: 130601 Date: 31-05-2013 **Subject Name: Surveying** Time: 02.30 pm - 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) Describe briefly the uses of various accessories of a plane table. 07 **(b)** Explain clearly the use of planimeter (with sketch) to calculate the area of a irregular figure. Q.2(a) Explain the repetition method to calculate a horizontal angle through a 07 theodolite. **(b)** Define the following terms clearly **07** (1) Latitude (2) Departure (3) Closing error (4) Balancing of traverse OR **(b)** Define the following terms in relation to theodolite **07** (1) Face left observation (2) Face right observation (3) Transiting (4) Line of collimation (5) Axis of level tube (6) Swinging (a) Describe resection and intersection method applied to plane table Q.3surveving. (b) The following are the values of offsets taken from a chain line to an 07 irregular boundary. Calculate the area included between chain line and irregular boundary by Simpsonøs rule. Distance 50 100 150 200 250 300 350 400 (m) Offset 10.6 15.4 20.2 18.7 16.4 20.8 22.4 19.3 17.6 (m) OR An instrument was set at P and the angle of depression to a vane 2 m 07 Q.3 (a) above the foot of staff held at O was 5⁰36\alpha The horizontal distance between P and Q was known to be 3000 m. Determine the RL of the staff station Q, given that staff reading on a BM of elevation 436.050 was 2.865 m. (b) Derive the expression for computing the horizontal distance and 07 elevation in trigonometrical levelling while base of the object is inaccessible and instrument axis is at very different level. **Q.4** (a) Define the following terms in relation to circular curve with a neat 07 sketch. (1) Tangent distance (2) Long chord (3) Deflection Angle (4) Apex distance (5) Mid- ordinate (b) Explain Rankine method of tangential angle for setting out simple 07 circular curve. OR (a) Define transition curve (with figure) and its function clearly. What are 07 **Q.4** the requirements of a transition curve?

	(b)	A transition curve is required for a circular curve of 200 m radius, the gauge being 1.5 m and maximum super elevation is restricted to 15 cm. The transition is to be designed for a velocity such that no lateral pressure is imposed on the rails and the rate of gain of lateral acceleration is 30 cm/sec ³ . Calculate the required length of transition curve and design speed.	07
Q.5	(a)	Describe various methods of locating soundings in hydrographic surveying.	07
	(b)	Explain the procedure of setting out of a bridge. OR	07
Q.5	(a)	Write short note on with figure (1) Compound curve (2) Reverse curve (3) Vertical curve	07
	(b)	Explain the instruments used for taking sounding.	07
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