Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER 2013

Subject Code: 130601 **Date: 03-12-2013**

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)** Explain with sketches, the use of various instruments and accessories of plane table survey. **07**

(b) Explain the method of taking horizontal angles by closing the horizon. **07**

Q.2 **(a)** In a closed traverse PQRSTP the bearings of the lines RT and TP could not be measured due to an obstruction. Determine the bearings from the following data. **07**

Line	length (m)	bearing
PQ	488	99 °
QR	666	33°
RS	477	300°
ST	675	?
TP	355	?

(b) How will you adjust closing error of traverse by bowdith' s rule.? **07**

OR

(b) Define: telescope normal, swinging, Discuss loose needle and fast needle method of theodolite traversing. **07**

Q.3 **(a)** Derive the equation to find out the elevation of the object , if the base of the Object is inaccessible, the instruments stations and elevated object are in the same vertical plane and instrument axes are at the same level. Also find out elevation of a hilltop based on the following data set. **07**

Inst ST	staff reading on B.M.	vertical angle to hill top	R.L. of the B.M.
O1	1. 655	26°	181.212M
O2	1.655	18°	

Distance between O1 and O2 is 123m.

(b) Explain the basic procedure, instruments and materials required to set out the foundation of a building on the ground as per the plan. **07**

OR

Q.3 **(a)** Write the method of setting out a culvert. **07**

(b) Area enclosed between the dam and upstream contours at a reservoir are as follows **07**

Contour level (m)	63	65	67	69	71
Enclosed area (sq m)	711	6512	52705	79500	374555

If the bottom level 63m and F.R.L and is 71m Determine the capacity of the reservoir by trapezoidal and simpson's formula.

Q.4 **(a)** Why are curves provided? State various types of curves with sketch? Draw **07**

the neat sketch of simple circular curve showing various elements of it.

(b) The chainage of the intersection point of two straights is 120 chains + 66 links and the deflection angle is $45^{o}\,20'$. A circular curve of 256m radius is to be set out to connect two straights. Calculate the necessary data for setting out the curve by the method of deflection angle. Length of one chain is 20m. Take peg interval = 20m. **07**

OR

Q.4 **(a)** Briefly discuss rankine's and two theodolite method of setting out simple circular curves. **07**

(b) Discuss types of transition and vertical curve with neat sketches. Also discuss advantages and disadvantages of transition curve. **07**

Q.5 **(a)** What is use of planimeter ? what is the zero circle.? Under what condition do the zero circles get traced by the tracing point? How you can find the area of zero circles? **07**

(b) An embankment of width 12 m and side slope 1.5:1 is required to be made on a ground which is in level in a direction transverse to the centre line. The centre height at 42m interval is as follows. **07**
1.02, 1 23, 2 22, 2 35, 1.87, 1.33, and 0.97. Calculate the volume of earthwork according to trapezoidal and Simpson's rule.

OR

Q.5 **(a)** What is sounding? W hat are the different methods of locating soundings? **07**

(b) What is spire test? Discuss the test in detail and also the method of adjustment. **07**

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