GUJARAT TECHNOLOGICAL UNIVERSITY
B.E. Sem-III Regular / Remedial Examination December 2010

Subject code: 130601   **Subject Name: Surveying**
Date: 13 /12 /2010   **Time: 10.30 am – 01.00 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 advantages and disadvantages of plane table survey   **05**
      (b) Define latitude and departure. Differentiate between the consecutive and **05** independent coordinates
      (c) Define the following in reference to the theodolite: **04**
          1. Transiting 2. Axis of level tube 3. Telescope normal 4. Changing Face

Q.2 **(a)** Following readings were taken for a closed traverse ABCDE, find out **05** the missing quantities

Line	Length	Bearing
AB	194.1	85° 30'
BC	201.2	15° 00'
CD	165.4	285° 30'
DE	172.6	185° 30'
EA	?	?

      (b) What is meant by balancing a traverse? State the various rules used to do **02** this
      (c) Explain the repetition method to measure horizontal angles and how **07** readings are recorded? What are the advantages of this method?
                                     OR
      (c) Explain the basic procedure, instruments and materials required to set **07** out the foundation of a building on the ground as per the plan

Q.3 **(a)** A theodolite was set up at a distance of 150 m from tower. The angle of **05** elevation to the top of the parapet was 10° 8' while the angle of depression to the foot of the wall was 3° 12'. The staff reading on the B.M of RL 50.217 with the telescope horizontal was 0.880. Find the height of the tower and the RL of the top of the parapet
      (b) Enlist different methods of plane table survey. Explain any one with **05** neat sketch
      (c) Describe briefly how soundings are located by (a) two angles from the **04** shore. (b) intersecting ranges
                                     OR
Q.3 **(a)** In setting up the plane table at a station A, it was found that the point 'a', **04** representing the station A on the plan was not exactly above the corresponding station A on the ground. If the displacement of point 'a' in the direction at right angles to a ray to P(AP) was 30 cm, find the consequent displacement of p from its true position given the following
          1. Scale of the plan 1cm=150m , distance AP= 2000 m
          2. Scale of the plan RF=1/600, distance AP=40 m

(b) Describe with neat sketch, the method of intersection use for plane table **05** survey. When it is used?

(c) Explain the objectives of hydrographic surveying. Define sounding. **05** Enlist the equipments required for sounding

Q.4 (a) A road embankment is 8 m wide and 200 m in length at the formation **05** level, with a side slope of 1.5:1. The embankment has a rising gradient of 1 in 100 m. The ground levels at every 50 m along the centre line are as follows:

Distance(m)	0	50	100	150	200
R.L. (m)	164.5	165.2	166.8	167	167.2

The formation level of zero chainage is 166 m. Calculate the volume of earth work

(b) What is the use of planimeter? What is the zero circle? Under what **05** condition does the zero circle get traced by the tracing point? How you can find the area of zero circle?

(c) What are the different methods of designation of a curve? Derive a **04** relationship between the radius and the degree of curve.

OR

Q.4 (a) The latitudes and departures of the lines of a closed traverse are given **05** below. Calculate the area of traverse.

Line	Northing	Southing	Easting	Westing
AB		157.2	154.8	
BC	210.5		52.5	
CD	175.4			98.3
DA		228.7		109.0

(b) Discuss in brief the various methods of measurement of area by offsets **05** from the baseline. State the relative merits and demerits of each methods

(c) How would you find out whether the vertical curve will have convexity **04** upwards or downwards if the gradients on the two sides of the apex are given? What is rate of change of gradient?

Q.5 (a) Describe the method of setting a circular curve by the method of offsets **05** from the long chord.

(b) What is a transition curve? Why and where it is provided? **04**

(c) Two tangents intersect at a chainage of 1400 m the deflection angle **05** being 24°. Calculate the following quantities for setting out a curve of radius 275 m
1. Tangent length 2. Length of long chord 3. Length of curve
4. Chainage of point of commencement and tangency 5. Apex distance

OR

Q.5 (a) Discuss the method of setting out a circular curve with two theodolite. **05** What are its advantages and disadvantages over Rankine's method

(b) What are the essential requirements of a transition curve? Derive an **04** expression for an ideal transition curve.

(c) Two tangents intersect at the chainage 1190 m, the deflection angle **05** being 36°.Calculate all the data necessary for setting out a curve with a radius of 300 m by deflection angle method. The peg interval is 30 m.

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