*Seat No.: _____* *Enrolment No._____*

**GUJARAT TECHNOLOGICAL UNIVERSITY**
**P.D.D.C. Sem- II (Civil)Examination June 2010**

**Subject code: X20601** **Subject Name: Advanced Surveying**
**Date:** **Time:**
**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)** What is the principle of Tachometry? Derive the expression for horizontal and vertical distance in the fixed hair method when the staff is held vertically and measure angle is that of elevation. **7**

**(b)** Describe the method of setting a simple circular by Rankine's deflection angle method. **7**

**Q.2** **(a)** What is sounding? What are the different methods of locating sounding? **7**

**(b)** A tacheometer was set up at station P and observations were made to a staff held normal to the line of sight over point Q. The vertical angle measured was $6^0$ 36'. The three hair reading were 1.905, 2.480, and 3.055. The reading from P, with the line of sight horizontal, to a BM of RL 852.55 was 1.855. If the instrument constants are 100 and 0.5, find the RL of Q. **7**

**OR**

**(b)** Two straights intersect at chainage 3075.40m and the angle of intersection is 130.If the radius of the simple curve to be introduced is 650m,Find the following: **7**

(i) Tangent distances
(ii) Chainage of the point of commencement
(iii)Length of the long chord.

**Q.3** **(a)** What is transition curve? When and why is it used? What are the basic criteria for the design of a transition curve? **7**

**(b)** The scale of the photograph is 1cm = 100 cm. The photograph size is 23cm x 23cm. Determine the number of photographs required to cover an area of 150 sq km. If the longitudinal overlap is 60% and side overlap is 30%. **7**

**OR**

**Q.3** **(a)** Describe the method of determining of constants of tacheometer from field measurements. **7**

**(b)** Find the gradient from P to Q using the data given in table **7**

| Instrument at | Staff at | Line | Bearing | Vertical angle | Cross hair reading |
|---|---|---|---|---|---|
| A | P | AP | $84^0$ 36' | $3^0$ 30' | 1.350, 2.100, 2.850 |
| A | Q | AQ | $142^0$ 24' | $2^0$ 45' | 1.955, 2.875, 3.765 |

The staff was held normal to the line of sight in both cases.

**Q.4** **(a)** Write short note on GIS **7**

**(b)** Explain application of remote sensing in civil engineering. **7**

**OR**

**Q.4** **(a)** Write short note on GPS **7**

**(b)** Write short note on Total station. **7**

**Q.5** **(a)** What is relief displacement . Derive an expression for the relief displacement in a vertical photograph. **7**

**(b)** Explain basic concepts in Remote sensing. **7**

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Define the following terms (i) The celestial sphere (ii) The azimuth(iii) Declination (iv) Hour angle (v) The Zenith and Nadir (vi) Hour circle (vii) Vertical circle | **7** |
| | **(b)** | Draw a neat sketch to show the latitude , longitude, zenith, nadir and poles. | **7** |