Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**PDDC 2ND Semester Examination – July- 2011**

**Subject code: X20601**

**Subject Name: Advanced surveying**

**Date:13/07/2011** **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)** Derive the expressions for horizontal and vertical distances in the fixed hair method when that staff is held vertically and the measured angle is that of elevation **07**

**(b)** To determine the distance between to stations A and B, a tachometer was setup at a point P on the line AB and the observations were recorded on a staff held vertical. **07**

| Instrument station | Staff station | Vertical angle | Staff reading | Remarks |
|---|---|---|---|---|
| P | A | $+10^0 30'$ | 2.000<br>2.405<br>2.825 | RL of A is 50m. |
| | B | $-2^0 5'$ | 1.655<br>1.950<br>2.255 | |

**Q.2** **(a)** Explain Tacheometer and its constants **07**

**(b)** Following reading were taken with a tacheometer on to a vertical staff. Calculate the tacheometor constants. **07**

| Horizontal distances | Stadia readings |
|---|---|
| 52.400m | 1.200, 1.465, 1.680 |
| 65.200m. | 1.860, 2.165, 2.470 |

**OR**

**(b)** Explain briefly the salient features of total station. **07**

**Q.3** **(a)** Explain meaning of triangulation survey. How will you select base line and triangulation station? Also define strength of figure. **07**

**(b)** Two station A and B are 80km. apart having 225m. and 550m. altitude respectively. The intervening obstruction situated at C, 40km. from A has a elevation of 285m. Ascertain if A and B are intervisible and if necessary find by how much B should be raised so that the line of sight must nowhere be less than 3m. above the ground surface. **07**

**OR**

**Q.3** **(a)** Define (i) Systematic error (ii) Weight of an observed quantity (iii) True value a quantity (iv) Mistake **07**

**(b)** Calculate the most probable vales of the angles of a triangle ABC from the following observation **07**

Angle A = $65^0$ 15' 12" Weight – 2

Angle B = $65^0$ 20' 00" Weight – 3

Angle C = $49^0$ 30' 15" Weight - 4

**Q.4** **(a)** What is tilt distention? Prove that in a tilt photo graph, tilt distention is radial from the isocentre. **07**

**(b)** A line AB appears to be 10.16cm. on a photograph for which the focal length is 16cm. The corresponding line measures 2.54cm of map which is to a scale 1:50000. The terrain has an average elevation of 200m. above mean sea level. Calculate the flying height of the aircraft above mean sea level. **07**

**OR**

**Q.4** **(a)** Explain following Astronomical terms **07**

(i) Zenith and Nadir (ii) The hour angle

(iii) Vertical circle (iv) The azimuth

**(b)** Determine the hour angle and declination of a star from the following observation. **07**

(i) Altitude of a star = 22° 36”

(ii) Azimuth of a star = 42° W

(iii) Latitude of a place = 40° N

**Q.5** **(a)** What are the key components of GIS ? Write functions of GIS **07**

**(b)** Describe the various applications of Remote Sensing and GIS in the field of civil engineering. **07**

**OR**

**Q.5** **(a)** What is Remote sensing ? Differentiate between Active and Passive remote sensing. **07**

**(b)** Explain various methods of interaction of EM radiation with matter. What is the effect of EM radiation of the earth surface ? **07**

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