GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–IV (New) EXAMINATION – WINTER 2015

Subject Code:2140601   **Date:30/12/2015**
Subject Name: Advanced Surveying
Time: 2:30pm to 5:00pm   **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 tacheometric surveying? Derive the expressions for horizontal and vertical distance in the fixed hair method when the line of sight is inclined but staff is held vertically and the measured angle is that of depression.   **07**

(b) A tacheometer was set up at a station A and the following readings were obtained on a staff vertically held.   **07**

Inst. Station	Staff Station	Vertical angle	Hair readings (m)			Remarks
A	B.M.	-7°20'	1.400	2.000	2.600	R.L. of B.M. =
	B	+6°40'	1.000	1.800	2.600	500 m.

Calculate the horizontal distance AB and R.L. of B., when the constants of instruments are 100 and 0.10.

Q.2 **(a)** What is the object of the geodetic surveying? Discuss criteria for the selection of suitable figure or systems.   **07**

(b) In a triangulation survey, the altitudes of two proposed stations A & B 85 km apart, are respectively 132 and 212m. The intervening obstruction is situated at C, 60km from and has an elevation of 142m. 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 surface of the ground. The earth's mean radius may be taken as 3000km and coefficient of refraction as 0.07.   **07**

OR

(b) Two triangulation stations P & Q are 100km apart and have elevations 335 m and 355 m respectively. The intervening ground may be assumed to have a uniform elevation of 300m. Find the minimum height of signal required at Q so that line of sight may not pass near the ground 4 metres.   **07**

Q.3 **(a)** Discuss the laws of accidental errors.   **07**
(b) Find the most probable values of the angles A, B and C of the triangle ABC from the following observation equations,
  A = 72°30'49",   B = 64°12'21",   C = 75°24'06"   **07**

OR

Q.3 **(a)** Explain the method of correlates. What are its advantages over the normal   **07**

equation method?

(b) The observed values of an angle are given below :   **07**

Angle	Weight
75°30'39"	2
75°30'38"	2
75°30'37"	3

Find : (i) Probable error of single observation value of unit weight.
(ii) Probable error of weighted arithmetic mean.
(iii) Probable error of single observation of weight 3.

Q.4 (a) Explain following term: **07**
1) Departure   2) Shortest distance   3) Nautical mile   4) Mean Solar Time
5) Apparent Solar Time 6) Sidereal time 7) Horizon.

(b) Write short note on 1) Relief Displacement 2) Aerial Camera.   **07**

OR

Q.4 (a) What is total station? Explain the various features of a total station.   **07**

(b) Explain the various applications of GIS and Remote sensing in civil   **07**
engineering with suitable examples.

Q.5 (a) Write short note on Geospatial analysis.   **07**
(b) Determine the number of photographs required for selected scale of 1 cm =   **07**
100m. The size of photograph is 25cm X 25 cm. for following two areas.
(i)   20000 km^2 (ii) 100 km X 100 km.

Assume 60% longitudinal overlap and 30% lateral overlap of area in
photographs.

OR

Q.5 (a) Prove that altitude of Pole (star) is equal to latitude of observer.   **07**
(b) What are the different types of EDM instruments? Give a brief description of   **07**
any one in detail.

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