

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-IV Remedial Examination Nov/ Dec. 2010****Subject code: 140601****Subject Name: Advanced Surveying****Date: 01 / 12 / 2010****Time: 03.00 pm – 05.30 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) What is the principle of tacheometry? 07

Derive the expressions for horizontal and vertical distances in the fixed hair method when the staff is held vertically and the measure angle is that of elevation.

(b) To determine the distance between two stations A and B, a tacheometer was set up at a point P on the line AB and the following observations were obtained on a staff vertically held 07

Instrument station	Staff station	Vertical angle	Staff Readings	Remark
P	A	+ 8° 24'	2.225, 2.605, 2.985	R. L. of A is 50.000 M
	B	- 1° 06'	1.640, 1.920, 2.200	

Calculate the horizontal distance AB and RL of B when the constants of instrument are 100 and 0.00.

Q.2 (a) Explain in detail the field procedure of tacheometric survey which you have carried out. 07**(b) Describe how a total station has brought revolution in surveying. Describe briefly the salient features of total station. 07****OR****(b) Describe Global Positioning System (GPS) in detail. 07****Q.3 (a) What is meant by triangulation? How will you select base line and triangulation stations? Explain strength of figure. 07****(b) The altitudes of two proposed stations A and B, 100 km apart, are respectively 420 m and 700 m. The intervening obstruction situated at C, 70 km from A has an elevation of 478 m. 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 3.10 m above the surface of the ground. 07****OR****Q.3 (a) Define weight of an observed quantity? Discuss various laws of weights. 07****(b) Determine the most probable values of the angles of a triangle PQR, from the following given data. Use method of correlates. 07**

$\angle P = 62^\circ 14' 12''$ weight 1
 $\angle Q = 48^\circ 12' 14''$ weight 3
 $\angle R = 69^\circ 33' 28''$ weight 2

- Q.4** (a) Explain the following astronomical terms: **07**
(i) The celestial sphere (ii) The hour angle
(iii) The horizon and (iv) Declination
Also write uses of field astronomy
- (b) Find the hour angle and declination of a star from the following data: **07**
Latitude of place = $48^{\circ} 30' N$
Azimuth of star = $50^{\circ} W$
Altitude of star = $28^{\circ} 24'$.

OR

- Q.4** (a) What is relief displacement? Derive an expression for the relief displacement in a vertical photograph. **07**
- (b) A straight length of a highway AB appears to be 12.5 cm on a vertical air photograph of 15 cm focal length. The corresponding distance of the highway on a 1: 50,000 topographical map is 6.25 cm. Assuming the average elevation of the terrain as 1250 m above M.S.L., calculate the flying height of the camera above mean sea level. **07**
- Q.5** (a) Explain the basic principle of remote sensing. **07**
Discuss image interpretation techniques.
- (b) Explain various methods of interaction of EM radiation with matter What is the effect of EM radiation of the earth's surface? **07**

OR

- Q.5** (a) Define GIS. What are the key components of GIS? **07**
Write functions of GIS.
- (b) Explain the various applications with suitable examples of Remote Sensing and GIS in civil engineering. **07**
