

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – SUMMER 2013****Subject Code: 140601****Date: 07-06-2013****Subject Name: Advanced Surveying****Time: 10:30am – 01:00pm****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)** Derive the expression for the horizontal and vertical distances in the fixed hair method when the staff is held vertically and the measured angle is that of elevation. **07**

- (b)** During the course of a tacheometric survey, the following readings were recorded **07**

Instrument station	Height of instrument	Staff station	Vertical angle	Staff reading	Remark
O	1.750	BM	- 8° 24'	1.250, 1.600, 1.950	RL of BM=312.670
O	1.650	CP	- 7° 12'	1.430, 1.580, 1.730	CP is change point
P	1.570	CP	+ 9° 36'	1.670, 1.950, 2.230	

The tacheometer was anallatic and the multiplying constant was 100. The staff was held vertical. Calculate the RL of station P.

- Q. 2 (a)** What is meant by triangulation? How will you select base line and triangulation stations? Explain strength of figure. **07**

- (b)** Define accidental error, true value, direct observation, conditioned quantity, most probable value, true error, normal equation. **07**

OR

- (b)** What is the principle of E.D.M.? Discuss electromagnetic waves and electromagnetic spectrum. **07**

- Q. 3 (a)** What is spherical triangle? State the properties of spherical triangle. **07**

- (b)** What is latitude of a place? Prove that the altitude of the pole is always equal to the latitude of the observer's position. **07**

OR

- Q. 3 (a)** Define the following terms used in aerial photogrammetry : **07**

(i) Oblique Photograph (ii) Exposure station (iii) Focal length
(iv) Principal point (v) Nadir point (vi) Isocentre (vii) Swing.

- (b)** Find most probable values of angles A, B and C of triangle ABC from the following observation equations : **07**

$$A = 60^{\circ} 12' 36'' , B = 53^{\circ} 46' 12'' , C = 58^{\circ} 01' 16''$$

- Q. 4 (a)** Write short note on “ station marks”. **07**

- (b)** What is tacheometric surveying ? What are the advantages of tacheometric surveying ? Explain various methods of tacheometry. **07**

OR

- Q. 4 (a)** What is relief displacement? Derive an expression for the relief displacement in a vertical photograph. **07**

- (b) In a pair of overlapping vertical photographs, the mean distance between two principal points both of which lie on the datum is 6.375 cm. At the time of photography, the air-craft was 600 m above the datum. The camera has a focal length of 150 mm. In the common overlap, a tall chimney 120 m high with its base in the datum surface is observed. Determine difference of parallax for top and bottom of chimney **0 7**
- Q. 5** (a) What is remote sensing? State how it differs from photogrammetry. Describe energy interaction with atmosphere and earth surface features. **0 7**
- (b) Explain the basic principle of remote sensing. Discuss image interpretation techniques. **0 7**
- OR
- Q. 5** (a) What is Geographical Information System (GIS) ? Explain key components of GIS. List various functions of GIS. **0 7**
- (b) Explain the various applications with suitable examples of Remote Sensing and GIS in civil engineering. **0 7**
