

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (OLD) EXAMINATION – WINTER 2018****Subject Code:140601****Date: 05/12/2018****Subject Name: Advanced Surveying****Time: 02:30 PM TO 05:00 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) Differentiate between (i) Fixed hair method and movable hair method (ii) Stadia method and tangential method. **07**

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

Station	Staff station	Vertical angle	Hair readings	Remarks
A	B.M.	-2°18'	3.225, 3.550, 3.875	R.L. of B.M.
	B	+8°36'	1.650, 2.515, 3.380	=437.655m

Calculate the horizontal distance from A to B and the R.L. of B, if the constants of the instrument were 100 and 0.4.

Q.2 (a) What is triangulation? What are the factors that affect the selection of triangulation stations? **07**

(b) Two triangulation stations A and B are 40km apart and have elevations of 178m and 175m respectively. Find the minimum height of signal required at B so that the line of sight may not pass nearer the ground than 3 meters. The intervening ground may be assumed to have a uniform elevations of 150meters. **07**

OR

(b) Explain the basic principle of EDM. Write a brief note on Electromagnetic spectrum. **07**

Q.3 (a) Explain the theory of least squares. **07**

(b) Following readings of levels were carried out 2.337, 2.347, 2.353, 2.301, 2.317, 2.307, 2.327 and 2.316. Calculate (i) Probable error for signal observation (ii) Probable error for mean. **07**

OR

Q.3 (a) What is field astronomy? Explain objectives of field astronomy. **07**

(b) What is vertical photograph? Derive an expression for the scale of a vertical photograph. How would you determine the scale of a given vertical photograph? **07**

Q.4 (a) What are the objectives of GIS? Discuss the key components of GIS. **07**

(b) The scale of an aerial photograph is 1cm=100m. The photograph size is 20cm ×20cm. Determine the number of photographs required to cover an area of 100 sq.km if the longitudinal lap is 60% and side lap is 30%. **07**

OR

Q.4 (a) Define remote sensing. Explain component of remote sensing. **07**

(b) Determine the azimuth and altitude of a star from the following data. **07**

Latitude of the observer = 46° N

Hour angle of star = 42°

Declination of star = 16°20' N

- Q.5 (a) What do you mean by GPS? Give an overview of GPS. Describe briefly the uses and applications of GPS. **07**
- (b) Write a short note on total station. **07**
- OR**
- Q.5 (a) What are the applications of GIS in civil engineering? **07**
- (b) Explain the interaction of EM energy with the earth features? **07**

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