Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 140601 **Date: 16-06-2014**

Subject Name: Advanced Surveying

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)** Explain the term 'Tacheometry'. What are the applications of tacheometric survey? Mention the instruments used in tacheometric survey. **04**

(b) Discuss the Stadia system of tacheometirc measurements. **04**

(c) A tacheomter was set up at station A and the following readings were obtained on a vertically held staff. **06**

Instrument Station	Staff Station	Vertical Angle	Staff Readings	Remark
A	BM	- 4^0 22'	1.050, 1.105, 1.155	RL of BM is
A	B	+ 10^0 0'	0.955, 1.035, 1.160	1958.30 m

The constants of instruments were 100.0 and 0.10. Find the distance of BM from A and distance AB, and also find out RL of B.

Q.2 **(a)** Distance between two proposed stations A and B in a triangulation is 100 km. Elevation of station A is 200m while that of B is 500 m. There is two peaks C & D between A and B at a distance 40 and 70 km from A and is having an elevation of 160 and 265 m respectively. Ascertain whether A and B are intervisible. If not intervisible find the minimum height of tower is required at B, so that B is visible from A with a minimum clearance of 2.5 m above the surface of the ground. **07**

(b)(1) Discuss uses of Triangulation survey **03**

(2) Give criteria for selection of triangulation figures. **04**

OR

(b) Differentiate between, Grid Iron and Central system of Primary triangulation. **07**

Q.3 **(a)** Discuss the types of errors. **04**

(b) Define the terms; i) Independent Quantity, ii) Conditioned Quantity, iii) True Value of a Quantity, iv) Direct observations, v) Indirect observations, vi) Weight of an observation and vii) Most Probable Value. **06**

(c) The following 10 readings were taken with a level under the identical conditions. **04**

1.810, 1.825, 1.835, 1.805, 1.850, 1.825, 1.820, 1.840, 1.845 & 1.835 meters.

Calculate the probable error of single observation, probable error of the mean and the maximum error.

OR

Q.3 **(a)** Briefly explain: How measurement with EDM instruments differs from taping? What are the advantages of EDM measurement? **04**

(b) List different types of EDM instruments and briefly write about each one of them. **04**

(c) Briefly Discuss these four basic types of total stations, i) Mechanical/Manual TS, ii) Motorized TS, iii) Auto lock TS and iv) Robotic/Automatic TS. **06**

Q.4 **(a)** Define the terms: i) Vertical photograph, ii) Tilted photograph and iii) Oblique photograph. **03**

(b) Discuss in detail, Flight planning for aerial photogrammetry. **06**

(c) To determine the average scale of an aerial photograph, three points A, B and C were selected. Their elevations were obtained from a contoured map as 1400m, 900m, and 1100m. If the flying height of the aircraft above mean sea level is 3500 m and the focal length of the camera lens is 160 mm, calculate the average scale of the aerial photograph. **05**

OR

Q.4 **(a)** Two points A and B which appear in a vertical photograph taken from a camera having focal length of 220 mm and from an altitude of 2800 m, have their elevations as 400 m and 600 m, respectively. Their corrected photo coordinates are as under: **06**

Point	Photo coordinates	
	x (mm)	*y* (mm)
a	+ 23.8	+ 16.4
b	- 13.6	- 29.7

Determine the length of the ground line AB.

(b) Discuss: How Terrestrial Latitudes and Longitudes are determined. **04**

(c) Write short note on, Spherical triangle and Spherical excess. **04**

Q.5 **(a)** Define Remote sensing and discuss types of remote sensing. **03**

(b) Discuss, Interaction of electromagnetic radiation with earth surface. **04**

(c) Discuss; spatial, spectral, radiometric and temporal resolutions of remote sensing. Briefly discus various operations involved in digital image processing for remote sensing. **07**

OR

Q.5 **(a)** Discuss various receiver types used for GPS positioning. **04**

(b) Define GIS and give its key components. **04**

(c) Discuss integration of remote sensing and GIS and explain use of RS & GIS data in preparation of Land use/ Land cover map. **06**

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