

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 tacheometric measurements. **04**
- (c) A tacheometer was set up at station A and the following readings were obtained on a vertically held staff. **06**

<u>Instrument</u>	<u>Staff</u>	<u>Vertical</u>	<u>Staff</u>	<u>Remark</u>
<u>Station</u>	<u>Station</u>	<u>Angle</u>	<u>Readings</u>	
A	BM	- 4° 22'	1.050, 1.105, 1.155	RL of BM is
A	B	+ 10° 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 are two peaks C & D between A and B at a distance 40 and 70 km from A and are 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 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 discuss 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**
