

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV (NEW) - EXAMINATION – SUMMER 2018

Subject Code:2140601

Date:24/05/2018

Subject Name:Advanced Surveying

Time:10:30 AM to 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.

MARKS

- Q.1**
- (a) What is techeometer, differentiate it with theodolite. **03**
 - (b) Define weight and give with examples any four laws of weight **04**
 - (c) Why three readings are taken in techeometry? Derive the distance and elevation formulae used in techeometry for staff held vertical and line of sight horizontal. **07**
- What do you mean by analytic lens? How are they useful in techeometer
- Q.2**
- (a) What are selection criteria of triangulation station? **03**
 - (b) Define (i) Principal point (ii) Nadir (iii) Zenith (iv) Celestial sphere **04**
 - (c) What are different types of triangulation systems? Find out minimum height of signal required at B so that the line of sight may not pass near the ground than 2.0 m if A and B two stations are 60 km apart and have elevations 140 m and 180 m respectively. Ground may be assumed to have uniform level of 100 m **07**

OR

- (c) Why overlap is necessary in photogrammetry? Determine number of photographs required to cover an area of 100 sq. km if longitudinal lap is 60% and side lap is 30%. Scale of an aerial photograph is 1 cm= 100 m and photograph size is 20 cm x 20 cm. **07**
- Q.3**
- (a) Define (i) vertical circle (ii) celestial horizon (iii) terrestrial equator **03**
 - (b) What is importance of base line? How is it selected? **04**
 - (c) Compute the horizontal distance PA and RL of point A for staff held vertically for below observations taken by techeometer. BM=100 m , K=100 and C=0 **07**
- | Inst. Station | Staff point | Vertical angle | Staff readings |
|---------------|-------------|----------------|---------------------|
| P | BM | -4° | 1.360, 1.915, 2.470 |
| | A | +5° | 1.065, 1.885, 2.705 |

OR

- Q.3**
- (a) Define (i) Drift (ii) Azimuth (iii) Longitude **03**
 - (b) What is relief displacement? Derive the equation for it **04**
 - (c) Following readings are taken by theodolite **07**
- | Angle | Weight | Angle | Weight | Angle | Weight |
|-------------|--------|-------------|--------|-------------|--------|
| 40° 20' 20" | 2 | 40° 20' 18" | 2 | 40° 20' 19" | 3 |
- Calculate (i) Probable error for single measurement for unit weight (ii) Probable error for single observation of weight 3 (iii) Probable error of weighted arithmetic mean
- Q.4**
- (a) State salient features of tangential method **03**
 - (b) Differentiate (i) Luminous and non- luminous signals (ii) Systematic errors and accidental errors **04**
 - (c) What is the principle of least square? Prove it **07**

OR

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|------------|---|-----------|
| Q.4 | (a) Derive equation for scale of vertical photograph | 03 |
| | (b) Give the classification of EDM instruments | 04 |
| | (c) What is energy interaction in remote sensing? Describe the energy interaction with earth surface features. | 07 |
| Q.5 | (a) State the application of GIS and GPS in Army | 03 |
| | (b) How remote sensing is useful in civil engineering? Give the types of remote sensing | 04 |
| | (c) Define pixel and describe different elements of visual image interpretation. | 07 |

OR

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| Q.5 | (a) What is GPS? Explain the working principle of GPS. | 03 |
| | (b) Give salient features of total station and state its advantages | 04 |
| | (c) Discuss all components of GIS and explain the interaction between GIS and GPS | 07 |
