

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023****Subject Code:2140601****Date:17-07-2023****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.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1**
- | | | |
|-----|---|-----------|
| (a) | Differentiate between Stadia hair method and Tangential Method. | 03 |
| (b) | Discuss criteria for the selection of suitable figure or system. | 04 |
| (c) | Describe the expression for horizontal and vertical distances by the fixed hair method when the staff is held vertically & the measured angle is that of elevation. | 07 |

- Q.2**
- | | | |
|-----|---|-----------|
| (a) | Define well-conditioned triangles, geodetic surveying, base line, | 03 |
| (b) | What is Tacheometric Surveying? What are the advantages of Tacheometric Surveying? | 04 |
| (c) | Determine the gradient from a point P to a point Q from the following observations made with a fixed hair tacheometer fitted with anallatic lens, the constant of the instrument being 100. | 07 |

Station	Bearing	Vertical angle	Reading of stadia hair (m)		Reading of axial hair
To P	340°	+ 12°	0.850	2.230	1.540
To Q	70°	+ 08°	0.710	3.150	1.930

OR

- Q.3**
- | | | |
|-----|--|-----------|
| (c) | Find the most probable values of angles P, Q, and R of a triangle PQR from the following measurements: P = 70°31'18.6" (Weight-3), Q = 61°12'11.8" (Weight-2), R = 48°16'36.6" (Weight-4), P+Q = 131°43'34.6" (Weight-2). Use method of Lagrange multiplier. | 07 |
|-----|--|-----------|

- Q.3**
- | | | |
|-----|---|-----------|
| (a) | Differentiate between Cumulative errors and Compensating errors | 03 |
| (b) | Explain Longitudinal overlap and side overlap of aerial photograph. | 04 |
| (c) | State and prove the principle of Least squares. | 07 |

OR

- Q.3**
- | | | |
|-----|--|-----------|
| (a) | Define Celestial Sphere, Nadir, Horizon. | 03 |
| (b) | Explain Principle and objective of Photogrammetry. | 04 |
| (c) | What is the weight of a quantity? Discuss various laws of weights. | 07 |

- Q.4**
- | | | |
|-----|---|-----------|
| (a) | Describe how total station has brought revolution in surveying? | 03 |
| (b) | Explain main purposes of field astronomy. | 04 |
| (c) | Explain the scale of vertical photograph derive equations and explain methods of determining the scale. | 07 |

OR

- Q.4**
- | | | |
|-----|--|-----------|
| (a) | If the probable error of direction measurement is 1.20", compute the maximum value of R for the desired maximum probable error of (i) 1 in 20,000. | 03 |
|-----|--|-----------|

- (b) Enlist the methods of determination of latitude & explain any one in detail. **04**
- (c) Explain with sketches, the different triangulation figures or systems. **07**
- Q.5** (a) Write short note on electromagnetic spectrum **03**
- (b) Explain uses of GPS **04**
- (c) Write application of GIS in civil engineering **07**
- OR**
- Q.5** (a) Discuss basic principle of operation and different techniques for E.D.M. Instruments. **03**
- (b) Explain Terrestrial coordinate system. **04**
- (c) Explain the components of remote sensing. **07**
