

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012****Subject code: 140601****Date: 27/12/2012****Subject Name: Advanced Surveying****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Explain principle of stadia method. **07**
(b) Explain the theory of least squares. **07**

- Q.2 (a)** Explain scale of vertical photograph. **07**
(b) The scale of an aerial photography is 1 cm = 100m. The photograph size is 20 cm x 20 cm. Determine the number of photographs required to cover an area 10 km x 10 km, if the longitudinal lap is 60% and the side lap is 30%. **07**

OR

- (b)** From a satellite station 'E' at a distance of 5.2 m from the main triangulation station 'D' the following directions or angles were observed: **07**
 D, $0^{\circ} 0' 0''$, A $150^{\circ} 20' 20''$, B, $207^{\circ} 46' 20''$, C, $281^{\circ} 34' 20''$
 $l(DA) = 2970.2\text{m}$, $l(DB) = 3890.4\text{m}$, $l(DC) = 2578.5\text{m}$
 Determine the direction of DA DB and DC

- Q.3 (a)** Explain "Laws of Weights". **07**
(b) Find the gradient from P to Q using the data given in Table **07**

Instrument at	Staff at	Line	Bearing	Vertical angle	Cross hair reading
A	P	AP	$84^{\circ} 36'$	$3^{\circ} 30'$	1.35, 2.10, 2.85
A	Q	AQ	$142^{\circ} 24'$	$2^{\circ} 45'$	1.9555, 2.875, 3.765

The staff was held normal to the line of sight in both cases. Value of tacheometric constants is 100 and 0.3.

OR

- Q.3 (a)** State the various points to be broadly considered in selection of base line. **07**
(b) Find the most probable value of the angle A from the following observation equations. **07**

$$A = 30^{\circ} 28' 40'' \text{ weight } 2.$$

$$3A = 91^{\circ} 25' 55'' \text{ weight } 3.$$

- Q.4 (a)** Explain following terms with the neat sketch **07**
 Vertical circle, observer meridian, altitude of star, declination of star, hour angle, azimuth, nautical mile, ecliptic.
(b) Explain electromagnetic spectrum. **07**

OR

- Q.4 (a)** What is total station ? State its field applications. **07**
(b) What is spherical triangle? State the properties of spherical triangle. **07**
Q.5 (a) Explain integration of Remote sensing and GIS. **07**
(b) Determine the hour angle and declination of a star from the following data: **07**
 (i) Altitude of the star = $22^{\circ} 36'$
 (ii) Azimuth of the star = 42°W
 (iii) Latitude of the place of observation = 40°N .

OR

- Q.5 (a)** State the use of GIS in various field. **07**
(b) Explain the displacement and errors in aerial photogrammetry. **07**
