SEMESTER 4TH

ADVANCED SURVEYING ASSIGNMENT / TUTORIAL

TACHEOMETER

(1) What is tacheometric surveying?

(2) What is the purpose of tacheometric surveying?

(3) Explain the principle of tacheometric surveying?

(4) Discuss briefly the method of tacheometric surveying?

(5) How to determine the concept of a tacheometric surveying from field measurement?

(6) Derive the expression for horizontal & vertical distance in the fixed hair method. When the staff is held vertically and

   (1) Measure of angle is elevation

   (2) Measure of angle is depression

(7) Write short note on analytical lens

(8) What is tangential method of tacheometry? Derive expression for horizontal and vertical distance by tangential method when both the angles measured are those of elevation

(9) The following observations were made for 2 stations A & B to determine the gradient of line AB. A tacheometer was set up at position O and the staff at A & B was held vertically

STAFF STATION	VERTICAL ANGLE	STAFF READING
A	+4°20’	1.230, 1.730, 2.230
B	+1°40’	1.060, 1.510, 1.960

(10) A staff was held vertically at a distance of 50m and 100m from the centre of a tacheometer fitted with stadia hair and the staff intercepts with the telescope horizontal were 0.500, and 1.000 respectively. The instrument was then set over a station A of R.L. 1100.50m and the height of instrument was 1.45m, the stadia hair

readings of staff at B held vertically to the ground were 1.000,1.850 and 2.700m while the vertical angle was -9°20'. Find distance AB and R.L. of point B.

(11) A substance theodolite were used to determine the horizontal distance from the intercept station . The micrometer reading the drum of diaphragm is 2.530 and 2.850 when the staff intercept was 3m . The micrometer screw had 100 threads to 1cm. The focal length of object glass was 230 mm. The distance of intercept X is from centre of object glass was measure 200 mm.

GEODETIC SURVEYING

(1) Difference between plain surveying and geodetic surveying.

(2) What if triangulation. Explain principle of triangulation.

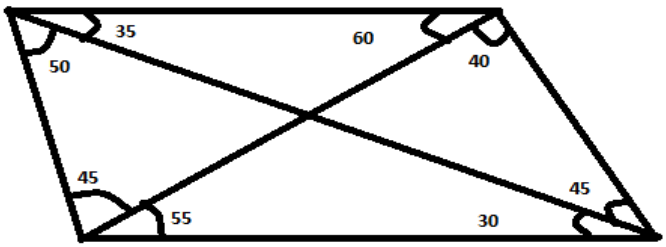
(3) What are the points to be considered while selecting the site for a base line. Also describe the methods of extending the base line and explain its necessity.

(4) Discuss how horizontal angles are measured in triangulation.

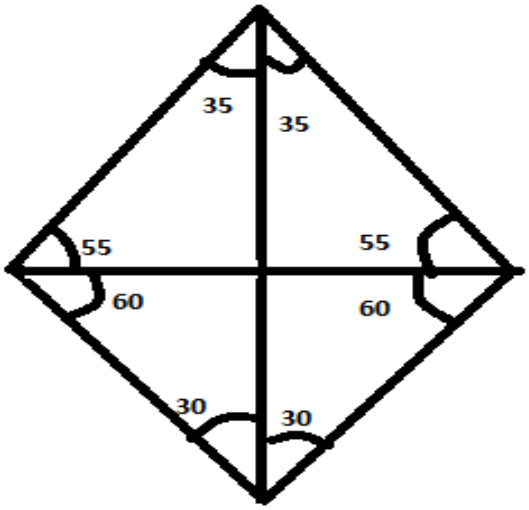
(5) The probable error is measured of angle is 1 sec. Find maximum value of R if maximum probable error in computing the skies is to limited to 1 in 20,000

(6) In a triangulation survey, the altitude of two stations A and B is 100km apart are respectively 430m and 712m. The invading obstacle is situated at C 60km from A and has a elevation of 438m as certain if A and B are inter visible and if necessary find by how much B should be raised so that the line of sight must nowhere be less than 3m above the surface of ground. The Earths mean radius may be takes as 6370km and coefficient of refraction is 0.07.

(7) In given figure AB is the known site and CD is the side whose length is required. Determine the values R1 and R2.



(8) Compute the strength of the figure ABCD for each of the roots by which the length BD can be computed from the known side AC. All the stations were occupied and all the angles were measured.



THEORY OF ERRORS

(1) What are different types of error in surveying measurement Explain each with examples

(2) Difference between

1 Most probable value and most probable error

2 independent and dependent quantity

3 true value and true error

4 observation and condition equation

(3) Discuss laws of accidental error

(4) State and prove principle of least squares

(5) How will you allocate weights to the field observations

(6) Explain the method of the differences for normal equation to obtain most probable values

(7) The following are three angles A B and C observe at a station O closing the horizon along with their probable error of measurement, determine the corrected values

A= 82°15’18’’ plus or minus 2

B= 120°26’12’’ plus or minus 4

C= 149°18’15’’ plus or minus 3

(8) Adjust the following angles closing the horizon A=112°20’47” weight 2 B = 90°30’15” weight 3 C= 58°12’5” weight 1

(9) Find most probable values of A B C from following observations

A = 45°15’22”

B = 35°20’25”

C = 55°40’36”

A+B = 80°35’50”

B+C = 91°1’6”

FIELD ASTRONOMY

(1) Define

1. Azimuth 2. Nadir 3. Zenith 4. Latitude 5. Longitude 6. Equipotential point 7. Ecliptic 8. Visible horizon 9. Sensible horizon

(2) Explain following terms with sketch

1. Vertical circle 2. Observer meridian 3. Altitude of star

4. Declination of star 5. Hour angle 6. Azimuth 7. Nautical mile

8. Ecliptic

(3)What is spherical Δ. State its properties.

(4)Enlist methods of determination of azimuth and explain any one method.

(5)Define circumpolar star. Establish condition for circumpolar star with neat sketch.

(6)Find zenith distance at lower and upper culmination of star having co-ordinates (RA=71°30' Δ=54°36'N) for an observer having latitude=θ=72°N. Draw neat sketch.

(7)Determine the hour angle and declination of a star from the following data:

1. Altitude of star=22°36'

2. Azimuth of star=42°

3. Latitude of place of abservation=40°N

(8)What is latitude of a place. Prove that the altitude of the pole is always equal to the latitude of the observed position.

ARIAL PHOTOGRAMATIC

(1)Explain principle and objectives of photogrometry.

(2)What is function of Aerial Camera.

Describe schemeticlly its essential parts.

(3)What is meant by scale of vertical photography.

(4)Determine scale of photography for terrain laying at elevation of 50 metres and 200 metres. If vertical photography was taken at an altitude of 1200 metres.

Take focal length of camera is 15 cm

(5) Explain the following terms:

1. Tilt

2. isocenter

3. overlap

4. Sidelap

5. Crap

6. Drift

7. Principle point

8. Exposure station

9. Ground and photo primciple point

10. Ground and photo nadir point

11. Principle plane

(6) Give classifications of aerial photographs

(7) Define relief displacement? Derive the equation.

(8) Explain the method of determining of length of line from photo co-ordinates

(9) Explain the process of finding elevation difference using paralex bar.

(10) An aerial survey is carried out at a scale of 1:1000 with cameras having focal distance of 15 cm, the size of photographs is 21cmx21cm assume overlap in direction of flight and normal to flight equal to 65% and 35% respectively.

Determine the no. of photographs to be taken for area

1. 20/22 km
2. 900 km^2

(11) Two points A & B having elevation of 54m and 36m respectively above mean sea level on a vertical photography taken by aerial camera having focal length of 18cm. The horizontal distance on ground between A & B is 531m. Photo co-ordinates of axis measured are X_a=-1.62cm and Y_a=-2.43cm and X_b=-1.71cm and Y_b=+2.61cm. Compute flying height above mean sea level.

(12) A runway strip appears in an old map as 7.2cm having scale of 1:10000 the runway strip is at 38m from mean sea level the focal length of camera is 18cm, the length of runway in aerial photograph is 18.9cm determine the elevation of existing station.

MODERN SURVEYING INSTRUMENTS

(1) Explain basic principle of EDM. Write a brief note on electromagnetic spectrum.

(2) Write short note on total station.

(3) Explain the working of 1. Telurometer 2. Geodemeter 3. Distomet

(4) Write short note on Electronic digital theodolite

REMOTE SENSING

(1) Explain various application with suitable example of remote sensing & GIS in civil engineering.

(2) Write short note on 1. An idealised remote sensing system
2. GPS

(3) Classify censous and censous system.

(4) Define remote sensing &explain principle of remote sensing.

Geographic Information System

(1) Explain the objectives of GIS. Define GIS.

(2) Explain components of GIS.

(3) What do you mean by topological model. Explain the appropriate example.

(4) Discuss the applications of GIS in civil engineering discipline.

(5) Describe how GIS can be useful in disaster management as a preventive and mitigation tool.