

Total No. of Questions : 10]

SEAT No. :

P4285

[4758] - 506

[Total No. of Pages : 3

T.E. (Civil)

**ADVANCED SURVEYING
(2012 Pattern) (Semester - II)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Assume suitable data if necessary.*

- Q1) a)** Define Geodetic Surveying. What factors are to be considered while selecting a best triangulation figure or system? **[5]**
- b) What are different types of errors in GPS signal or result. **[5]**

OR

- Q2) a)** Differentiate between triangulation and traversing and trilateration. **[5]**
- b) State any four advantages of space based positioning systems. **[5]**
- Q3) a)** The following observations were made on three stations A,B & C from a boat at O with the help of a sextant. Station B & O being on the same side of AC. Calculate the distances of the boat from the three stations.
Angle AOB = $30^{\circ}25'$, Angle BOC = $45^{\circ}25'$, Angle ABC = $130^{\circ}10'$.
AB = 4000 m, BC = 4995 m. **[6]**
- b) Derive the expression for the difference of level between two points A and B a distance D apart, with the vertical angle as the angle of elevation from A to B. The height of the, instrument at A and that of the signal at B are equal. **[4]**

OR

- Q4) a)** A,B, & C are three visible stations in a hydrographic survey. The computed sides of the triangle ABC are AB = 1200 m, BC = 1442 m & CA = 1960 m. Station O is established outside the triangle and its position is to be determined by resection on A,B, & C, the angle AOB and BOC being respectively $45^{\circ} 30'$ and $52^{\circ} 15'$. Determine distances of OA and OC, if O & B are on the opposite sides of line AC. **[6]**

P.T.O.

- b) Explain with a neat sketch how the alignment of tunnel is transferred from surface to the underground? [4]

Q5) a) Explain step by step procedure for figure adjustment for a geodetic quadrilateral without central station. [5]

- b) Explain the following terms : [5]
Conditioned Equation, True Error, Most Probable Value, Residual Error.

c) Find the most probable values of the angles closing the horizon at a station, from the following observations. [8]

$$A = 110^{\circ} 5' 58.9'' \quad \text{wt. 2}$$

$$B = 98^{\circ} 45' 16.1'' \quad \text{wt. 1}$$

$$C = 72^{\circ} 55' 30.7'' \quad \text{wt. 3}$$

$$D = 78^{\circ} 13' 17.3'' \quad \text{wt. 1}$$

OR

Q6) a) What is spherical excess? What are the methods of computing the sides of a spherical triangle? Explain any one method. [5]

- b) Explain the following terms : [5]
Independent Quantity, Weight of an observation, Mistake, True Value

c) The following values were recorded for a spherical triangle ABC, the individual angles are: [8]

$$A = 62^{\circ} 28' 06'' \quad \text{wt. 8}$$

$$B = 57^{\circ} 43' 36'' \quad \text{wt. 6}$$

$$C = 59^{\circ} 48' 38'' \quad \text{wt. 4}$$

Spherical excess was known to be $7''$. Find the corrected spherical angles.

Q7) a) Define Relief displacement. Derive an equation to determine the height of an object with neat sketch. [5]

- b) What is parallax of a point. Describe the procedure of measuring parallax. [5]

c) A tower PK, 50m high, appears in a vertical photograph taken at a flight altitude of 2500 m above m.s.l. the distance of the image of the top of the tower is 6.35 cm. compute the displacement of the image of the top of the tower with respect to the image of its bottom. The elevation of the bottom of the tower is 1250 m. [6]

OR

- Q8)** a) What are the types of aerial photographs? Explain drift and crab. [5]
b) Explain in brief the procedure for determining Air Base Distance using mirror stereoscope. [5]
c) A square building on the ground $30\text{m} \times 30\text{m}$ base, Appears on the photograph with side top = 19.60 mm, side base = 18.00 mm, focal length = 150.20 mm. Determine the height of building. [6]
- Q9)** a) Draw a neat sketch of Electromagnetic Spectrum and show all bands. [5]
b) What is Digital Image Processing and explain various techniques. [5]
c) Explain use of remote sensing and GIS for Earthquake management. [6]

OR

- Q10)** a) Explain supervised and unsupervised classification of digital images. [5]
b) What is geo-stationary and sun-synchronous satellites. [5]
c) Explain use of remote sensing and GIS for drinking water management. [6]

