

Total No. of Questions : 10]

SEAT No. :

P3340

[Total No. of Pages : 4

[5353]-506

T.E. (Civil)

ADVANCED SURVEYING

(2015 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.No.1 or Q.No.2, Q.No.3 or Q.No.4, Q.No.5 or Q.No.6, Q.No.7 or Q.No.8, Q.No.9 or Q.No.10.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

Q1) a) Explain with neat sketches, commonly used layouts of triangulation systems? **[5]**

b) What is SBPS? State and explain GAGAN system. **[5]**

OR

Q2) a) Define, **[5]**

- i) Well conditioned triangle
- ii) Strength of a figure.
- iii) Accuracy of Triangulation
- iv) Intervisibility of stations
- v) Station marks

b) Explain the graphical method of solving three point problem. **[5]**

Q3) a) Explain the term sounding and explain any two methods of locating the sounding positions. **[5]**

b) Differentiate between raster data and vector data with example **[5]**

OR

P.T.O.

Q4) a) What are the different types of errors in GPS observation and explain any one of them. [5]

b) Explain Remote sensing applications in disaster management with suitable example. [5]

Q5) a) Define with example : [6]

i) Direct and indirect observation

ii) Independent and conditioned quantity

iii) Observation equation and conditioned equation

b) Explain stepwise procedure of computations of sides of spherical triangle by spherical trigonometry. [4]

c) The following angles are measured at a station closing the horizon. The values of the angles are : [8]

A = $77^{\circ}14'20''$ weight 4

B = $49^{\circ}40'35''$ weight 3

C = $53^{\circ}04'52''$ weight 2

Give the corrected values of the angles. (use method of correlates)

OR

Q6) a) Define : [5]

i) True error,

ii) Most probable value,

iii) Conditioned Quantity

iv) Residual error,

v) weight of an observation

b) What kinds of error in triangulation adjustment? Explain in detail. [5]

c) Find the most probable values of the angles A, B and C of a triangle ABC from the following observations (Use method of differences). [8]

Angle	Weight
Angle A = $65^{\circ}15'30''$	3
Angle B = $51^{\circ}11'25''$	2
Angle C = $63^{\circ}32'34''$	4

Q7) a) Define the following terms with sketch : **[8]**

- i) Principal point,
- ii) Scale
- iii) Air base distance,
- iv) Digital elevation model.

b) The scale of aerial photograph is 1: 10000, effective at an average elevation of terrain of 500 m. The size of aerial photograph is 230mm × 230mm. Focal length of camera lens is 20 cm. Speed of aircraft is 180 kmph, longitudinal overlap is 60% and side overlap is 30%. Determine the number of photographs required to cover an area of 30km × 22.5 km. Also determine exposure interval and flying height. **[8]**

OR

Q8) a) Derive an expression for displacement due to ground relief. **[8]**

b) A pair of photograph is taken with a camera having focal length 15 cm. The scale of photography is 1 : 10000 and photo base is 5.65 cm. The measured parallax of a vertical control point having an elevation 140 m is 87.28 mm. Compute the elevation of another point P whose measured parallax is 84.18 mm. **[8]**

Q9) a) Find the difference of levels of the points P and Q and RL of P from the following data : **[10]**

Angle of depression P to Q = $1^{\circ} 32' 12''$

Horizontal dist. Between PQ = 7118 m

Height of signal at P = 3.87 m

Height of Instrument at Q = 1.27 m

Coeff. Of refraction = 0.07

RL of Q = 417.860 m

Take $R \sin 1'' = 30.88\text{m}$

b) While doing an underground survey describe the transferring the surface alignment through a Shaft with the help of neat sketch? **[6]**

OR

- Q10)** a) 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. [10]
- b) Explain stepwise with neat sketch, how determine the location of pier s of bridge. [6]

