P2917

SEAT No. :

[Total No. of Pages : 4

[5669] 506

T.E. (Civil)

EVANCED SURVEYING

(2015 Pattern)

Time : 2¹/₂ Hours]

[Max. Marks : 70

Instructions to the condidates:

- 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) The triangulation stations A and B 50KM apartare having elevations 243m and 260m respectively. The intervening ground may be assumed to have a uniform elevation, of 216m. Find the minimum height of the signal required at B, so that the line of sight may not pass the near the ground than 2.4m.
 - b) Explain the three point problem in hydrographic surveying and list out the methods for solving it. [4]

OR

- Q2) a) Explain the sources of errors in SBPS positioning.
 - b) Explain graphical method for solution of three point problem in hydrographic surveying. [4]
- (Q3) a) Define Remote Sensing and explain use of electromagnetic spectrum in remote sensing.[6]
 - b) What do you mean by sounding? Explain how soundings are measured. [4]

P.T.O.

[6]

- Q4) a) What is GIS? Enlist and explain the components of GIS.
 - b) State different methods of locating soundings used in hydrographic surveying. Explain any one in detail. [4]

[6]

[5]

[8]

- Q5) a) Explain different sources of errors.
 - b) Define :
 - i) Accuracy,
 - ii) Conditioned and normal equation,

iii) Observation equation, and

iv) Weight

c) The angles of a spherical triangle PQR were observed as follows : [5]

$$P = 490^{\circ} 11' 13.2"$$
 weight=

 $Q = 74^{\circ} 26' 34.8"$ weight=3

 $R = 56^{\circ} 22' 17''$ weight

If the area of the above spherical triangle is 1764 sq. km, adjust the angles of triangle. Take spherical excess equal to 1" for every 196 sq. km area.

V OR

- Q6) a) Explain the process of adjustment in case of geodetic quadrilateral with no station at the intersection of diagonals. [5]
 - b) Determine the most probable values of the angles of a triangle ABC using method of correlates, given by the following data: [8]

$$A = 62^{\circ} 14' 12''$$
 weight=1

 $B = 48^{\circ} 12' 14''$ weight=3

 $C = 69^{\circ} 33' 28''$ weight=2

c) What do you mean by spherical excess? Explain the procedure of determining the sides of spherical triangle. [5]

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Q7) a) Define relief displacement. Derive an expression for the same.

- b) Define :
 - i) Isocentre,
 - ii) Exposure Station,
 - iii) Flying height and
 - iv) Tilt and tip
- c) The scale of an aerial photograph is 1 cm = 160 m & the size of the photograph is $20 \text{ cm} \times 20 \text{ cm}$. If the longitudinal overlap is 65 % and side overlap is 35 %, determine the number of photographs required to cover an area of 232 sq. Km. [6]

[5]

[5]

OR

- Q8) a) What are the different types of aerial photograph? Compare a map with aerial photograph. [5]
 - b) Explain the procedure of determining the minimum number of aerial photographs required to cover a given area. [5]
 - c) Determine the minimum number of aerial photographs required to cover an area of 40 km X 30 km, with the following details : [6]

Size of an aerial photograph = 23 cm X 23 cm

Scale of aerial photograph; 1 cm = 150 m

Longitudinal overlap = 60 %

Side overlap = 30 %

- Q9) a) Derive an expression for the difference of level between two points A and B distance D apart, with the vertical angle as angle of elevation from A to B. The height of the instrument at A and that of the signal at B are equal.
 - b) Explain the procedure of marking the alignment of the tunnel on the surface of the ground and transferring the alignment underground. [8]

OR

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Q10)a) It is required to determine the elevation of a station O. Observations were made to three stations A, B and C aready fixed and of known elevations. The following data was recorded [8]

Inst. Stn	Stn obs.	Ht. of inst	Distance (m)	Ht. of signal	Vertical angle
0	A 1.50	3600	5.6	1°1′20″	
	B		4700	4.1	-53' 00''
2	C		5000	4.9	-34' 10"

Describe the procedure for determining centre line length of bridge and b) procedure for location of bridge piers while setting out a bridge. [8]

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