

B.Tech-6th
Advance Surveying

(Set-1)

Full Marks : 70

Time : 3 hours

Answer Q.No.1 and any five from the rest

The figures in the right-hand margin indicate marks

Assume any other data wherever necessary

1. Answer all questions : 2×10

- (a) What do you mean by parallax in photogrammetric surveying (explain with suitable figure) ?
- (b) What do mean by 'shift' of a curve (with suitable sketch) ?
- (c) Briefly discuss the various methods employed in tacheometry.
- (d) What are the operations/steps involved in triangulation survey ?

(Turn Over)

(e) What do you mean by total station and why it is used ?

(f) What do you understand by remote sensing ?

(g) Distinguish clearly between close traverse and open traverse.

(h) What is GPS ? Explain.

(i) What is GIS and what are the components ?

(j) Find the relation between latitude of place, declination and altitude of a point in a celestial sphere with the help of suitable figure.

2. Write short notes on two of the following : 5×2

(i) Ideal transition curve

(ii) Applications of GPS

(iii) Daylight, Luminous and Night Signal.

3. (a) What is the error of closure in traverse surveying and how it is balanced graphically? 3

(b) While traversing Burla, a closed traverse ABCD was made. Due to the obstructions it was not possible to observe the bearings of lines BC and CD. Calculate the missing bearings? 7

Line	Length (m)	W.C.B
AB	550	60°
BC	1200	?
CD	880	?
DA	1050	310°

4. (a) What do you mean by relief displacement on a vertical photograph (explain with suitable figure)? The distance from the principal point to an image on a photograph is 6.44 cm and the elevation of the object above the datum (sea level) is 250 m. What is the relief displacement of the point if the datum scale is 1/10000 and the focal length of the camera is 20 cm? 6

(b) The scale of the photograph is 1 cm = 100 m. The photograph size is 23 cm × 23 cm. Determine the number of photographs required to cover an area of 15 km × 10 km if the longitudinal overlap is 60% and the side overlap is 30%? 4

5. (a) Briefly discuss the accepted grades (classification) of triangulation system. Also discuss common figures used for triangulation. 4

(b) The triangulation stations A and B, 60 km apart, have elevations 240 m and 280 m respectively. Find the minimum height of the signal required at B so that the line of sight may not pass nearer the ground than 2 m? The intervening ground may be assumed to have a uniform elevation of 200 m. 6

6. (a) The local mean time at a place in longitude $69^\circ 30' \text{ E}$ is $8^{\text{h}} 20^{\text{m}} 16^{\text{s}}$. Find the standard time if the place is in India. The standard meridian for India is $82^\circ 30' \text{ E}$. 3

- (b) Determine the declination and hour angle of a star for the following data :

Latitude of observer = $49^{\circ}20'$ N, Altitude of star = 22° , Azimuth of star = 50° W 7

7. Write short notes on *two* of the following : 5 x 2

- (i) Applications of GIS in Civil Engineering
- (ii) Electromagnetic distance measurement
- (iii) Stages of idealized remote sensing system.

8. (a) What is a compound curve ? How to set a compound curve ? 4

- (b) In the tangential method of tacheometry, two vanes were fixed at an interval of 2 m apart, the lower vane being 0.5 m above the foot of the staff held vertical at station A. The vertical angles measured were $+1^{\circ}12'$ and $-1^{\circ}30'$. Find the reduced level and horizontal distance of A, if the height of the line of collimation is 100 m ? 6
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