BTS (C) – IV – (S) – 07 – 002 (D)

B. Tech Degree IV Semester (Special Supplementary) Examination, March 2007

CE 402 SURVEYING II

(1999 Admissions onwards)

Time : 3 Hours Maximum Marks : 100

I. (a) Derive the formula for calculating offsets from chords produced for setting out a simple curve. (10)

(b) Two straights intersect at chainage 2056.44 m and the angle of intersection is 120°. If the radius of the simple curve to be introduced is 600 m, find the following :

(i) Tangent distances
(ii) Chainage of the point of commencement
(iii) Chainage of the point of tangency
(iv) Length of long chord. (10)

OR

II. (a) What are the advantages of providing a transition curve? How will you set out it? Explain. (10)

(b) Two tangents intersect at chainage 1190 m, the deflection angle being 36°. Calculate all the data for setting out a curve with a rad of 300 m by deflection angle method. The peg interval is 30 m. (10)

III. (a) How will you classify triangulation systems?
(b) What are the factors to be considered while selecting triangulation stations? } (8)
(c) Two triangulation stations A & B, 60 Km apart, have elevations of 265 m and 282 m, resp. The intervening ground may be assumed to have a uniform elevation of 220 m. Find the minimum height of signal at B so that the line of sight may not pass near the ground less than 3 m. (12)

OR

IV. (a) What is a satellite station? How would you reduce the horizontal angles? (10)

(b) From a satellite station S 14 m from A, angles measured to three triangulation stations are as follows : $\angle CSA = 32°45'48''$

$\angle BSC = 68^{6}26'36''$

The lengths of sides AC & AB are 5678 m and 1441 m, respectively. Find the angle BAC. (10)

V. (a) Explain the 'laws of weight'. (10)

(b) Determine the most probable values of A, B and C from the following observations of equal weight :

(Turn Over)

$A = 30°24'25.3''$

$B = 40°15'14.2''$

$C = 70°39'41.3''$.

The angles fulfill the condition $A + B = C$. (10)

OR

VI. (a) Explain the figure adjustment of a plane triangle. (10)

(b) Find the most probable values of the following angles closing the horizon at a station :

$P = 45°23'37''$, weight $= 1$

$Q = 75°37'15''$, weight $= 2$

$R = 125°21'21''$, weight $= 3$

$S = 113°37'59''$, weight $= 3$. (10)

VII. (a) List the various methods of determining the latitude of a place. Explain *any one* method. (10)

(b) Find the azimuth and altitude of a star from the following data :

Declination of star = $22°45'N$

Hour angle of star = $45°15'$

Latitude of the observer = $55°N$. (10)

OR

VIII. (a) Explain the following :

(i) Sidereal time (ii) Apparent solar time

(iii) Mean solar time (iv) Standard time. (12)

(b) If the Greenwich Civil time is 8 h 30 m 15 S P.M on March 10, 2007, find the L.M.T of the following places :

(i) $82°30'E$ (ii) $120°W$. (8)

IX. (a) What is meant by sounding? Discuss various methods of taking soundings. (10)

(b) A, B and C are three signals on a coast line. The distances AB & BC are respectively 1340 m and 1520 m, and the included angle ABC is $112°15'$. The sounding point P is in the sea. The angles APB and BPC measured with a sextant are respectively $40°25'$ and $48°15'$. The signal A is to the west of BP whereas the station C is to the east of BP. The point P is to the south of B. Calculate the distances AP, BP and CP. (10)

OR

X. (a) Explain the following terms in connection with the aerial survey :

(i) Scale (ii) Overlap (iii) Flight-lines. (6)

(b) How does an aerial photograph differ from a map? (8)

(c) The distance of an image of a triangulation station 250 m above MSL from the principal point is 3.20 cm. Calculate the height displacement if the flying height of the camera is 2000 m. (6)

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