

# B. Tech Degree IV Semester Examination April 2011

## CE 402 A/B SURVEYING II (2002 Scheme)

Time : 3 Hours

Maximum Marks : 100

- I. (a) Explain briefly the elements of a simple curve. (10)  
 (b) Two tangents intersect at the chainage of 1190m, the deflection angle being  $36^\circ$ . (10)  
 Calculate all the data necessary for setting out a curve with a radius of 300m by deflection angle method. The peg interval is 30m.

OR

- II. (a) What is a transition curve? What are its advantages? (8)  
 (b) The following data refers to a right-hand compound curve: (12)  
 Total deflection angle =  $80^\circ$   
 Radius of the first arc = 200m  
 Radius of the second arc = 250m  
 Chainage of the point of intersection = 1504.80m  
 Deflection angle of the first arc =  $50^\circ$

Determine the chainages of the point of curvature, the point of compound curve and the point of tangency.

- III. (a) What is the principle of triangulation? Which are the factors to be considered in the selection of triangulation stations? (12)  
 (b) There are two stations A and B at elevations of 200m and 1000m respectively. The distance between A & B is 100 km. If the elevation of a peak P at a distance of 40km from A is 300m. Show that the stations A and B are intervisible. (8)

OR

- IV. (a) What is a satellite station? How would you reduce the horizontal angles? (10)  
 (b) A line was measured with a steel tape which was exactly 30m at  $20^\circ\text{C}$  at a pull of 100N. (10)  
 The measured length was 1500m. If the temperature during measurement was  $28^\circ\text{C}$  and the pull applied was 150N, determine the correct length of the line.  
 Cross-sectional area of the tape =  $2.5\text{mm}^2$   
 Coefficient of expansion =  $3.5 \times 10^{-6}$  per  $^\circ\text{C}$   
 Modulus of elasticity =  $2.1 \times 10^5 \text{N/mm}^2$

- V. (a) Which are the different laws of weights? Explain. (10)  
 (b) Find the most probable value of the angles A,B and C of a triangle ABC from the following observations: (10)

$$A = 65^\circ 15' 30'', \text{ weight } 3$$

$$B = 51^\circ 11' 25'', \text{ weight } 2$$

$$C = 63^\circ 32' 34'', \text{ weight } 4$$

OR

- VI. (a) What do you mean by the theory of least squares? (8)  
 (b) Find the most probable values of the following angles closing the horizon at a station. (12)  
 $P = 45^\circ 23' 37'', \text{ weight } = 1$   
 $Q = 75^\circ 37' 15'', \text{ weight } = 2$   
 $R = 125^\circ 21' 21'', \text{ weight } = 3$   
 $S = 113^\circ 37' 59'', \text{ weight } = 3$

(P.T.O)

- VII. (a) Explain **any one** method of co-ordinate system for specifying the position of a celestial body. (8)
- (b) Determine the hour angle and declination of a star from the following data: (12)

Altitude of the star =  $21^{\circ}30'$   
Azimuth of the star =  $140^{\circ}E$   
Latitude of the observer =  $48^{\circ}N$

OR

- VIII. (a) Find the G.M.T. corresponding to the following L.M.T. (8)
- (i)  $9^h 40^m 12^s$  A.M. at a place in longitude  $42^{\circ}36'W$
- (ii)  $4^h 32^m 10^s$  A.M. at a place in longitude  $56^{\circ}32'E$
- (b) Explain the following terms: (4 x 3=12)
- (i) Equation of time
- (ii) Sidereal time
- (iii) Sun dial
- (iv) Standard time

- IX. (a) Explain in brief the different methods of sounding. (10)
- (b) A, B and C are three triangulation stations on a coast line and P is a sounding point in sea. Distance  $AB=1250m$ ,  $BC=1310m$ , angle  $ABC = 122^{\circ}30'$ , angle  $APB = 45^{\circ}24'$  and angle  $BPC = 48^{\circ}36'$ . A and C are respectively west and east of BP where as P is south of B. Calculate the distances AP, BP and CP. (10)

OR

- X. (a) Write the comparison between Air photograph and Map. (8)
- (b) A straight length of a highway AB appears to be 12.5cm on a vertical air photograph of 15cm focal length. The corresponding distance of the highway on a 1:50,000 topographical map is 6.25cm. Assuming the average elevation of the terrain as 1250m above M.S.L, calculate the flying height of the Camera above Mean Sea Level. (12)