Code No: NR220106 **NR**

II B.Tech II Semester Supplementary Examinations, Nov/Dec 2005
SURVEYING-II
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Two stations at elevations of α and β are sighted by a theodolite in which the line of collimation is inclined to the trunnion axis at an angel (90^0 - e), where 'e' is small. [9+7]
   i. Derive an expression for the error in the horizontal angel between the two stations as given by the instrument.
   ii. Show by a diagram the effect of the collimation error on the vertical circle reading of one station.
   iii. What is the effect of measuring the horizontal and vertical angles on both faces?

   (b) In a straight line ABC, AB measure 354.384 m, BC measures 282.092 m and AC measures 636.318 m using a particular EDM reflector combination. A line measures 533.452 m with this instrument reflector combination. What is the correct length of the line?

2. From a common point A, traverses conducted on either side of a harbour are as follows: [16]
   Traverse (1)

Line	Length (m)	Bearing
AB	200	$85^0 26^1 20^{11}$
BC	100	$125^0 10^1 40^{11}$

   Traverse (2)

Line	Length (m)	Bearing
AD	225	$173^0 50^1 00^{11}$
DE	500	$85^0 06^1 40^{11}$

   Calculate the distance from C to a point F on DE due south of C and the distance EF.

3. (a) Derive the equation for elevation for a case when the staff is held vertical and line of sight of tacheometer is inclined upwards. [8+8]

   (b) Derive an expression for horizontal distance of vertical staff from a theodolite with stadia diaphragm, when the line of sight is horizontal. Explain how the usual expression for horizontal distance 'D' and vertical component 'V' can be deduced from the above expression when the line of sight is inclined.

4. (a) Describe a method of setting out a simple circular curve with the help of chain and tape only. [8+8]

(b) Two parallel railway lines are to be connected by a reverse curve, each section having the same radius. If the lines are 10 m apart and the maximum distance between tangent points measured parallel to the straights is 40 m. Find the maximum allowable radius. If however, both the radii are different, calculate the radius of the second branch if that of the 1^{st} branch is 50m. Also calculate lengths of both branches.

5. (a) What is a transition curve? Why it is used? Define 'shift' of a curve. Draw two tangents and show a circular curve and two transition curves connecting the tangents, marking the 'shift', on your sketch. [8+8]

   (b) How the transition curve be set out. Explain.

6. (a) Define the coefficient of refraction. Explain how its value can be obtained by simultaneous reciprocal observations. [8+8]

   (b) Describe the difference between the techniques of reciprocal 1eveIling and reciprocal trignometrical leveling, and discuss the conditions in which each is most effectively used

7. (a) What do you understand by horizontal control? What are different methods of establishing a horizontal control? [8+8]

   (b) What considerations you would have while selecting the site for the base line

8. Adjust the angles α and β, observations of which give [16]
   $\alpha = 20^0$ 10' 10" weight 6
   $\beta = 30^0$ 20' 30" weight 4
   $\alpha + \beta =$ 500 30' 50" weight 2

⋆ ⋆ ⋆ ⋆ ⋆