

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

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Differentiate between temporary and permanent adjustments of a theodolite.
 (b) Describe the collimation adjustment for a theodolite.
 (c) Describe how you would make the trunnion axis of a theodolite perpendicular to the vertical axis.
2. (a) Explain briefly the different method of checking the correctness of angular observations in an open theodolite traverse.
 (b) In order to fix a point 'F' exactly midway between A and E, a traverse was run as follows:

| Line | Length | Bearing |
|------|--------|---------|
| AB | 400 m | 30° |
| BC | 500 m | 00° |
| CD | 600 m | 300° |
| DE | 400 m | 30° |

Assuming point 'A' as origin, calculate (a) the independent coordinates of points 'C' 'E' and 'F'; (b) the length and bearing of 'CF'.

3. (a) Describe the conditions under which tacheometric surveying is advantageous.
 (b) Staff readings observed with a percentage theodolite corresponding to angles of elevation of 4% and 5% are 1.525 and 2.925 respectively. If the vertical angle on sighting the staff reading equal to the height of the trunnion axis above the ground was 4.5%. Calculate
 - i. the horizontal distance between the instrument and the staff
 - ii. the elevation of the staff station if that of the instrument station was 493.700
4. (a) Where are the reverse curves used?
 (b) A circular curve is to pass three points A,B and C. The chords AB = a, BC = b and $\angle ABC = \alpha$ are measured. Show that the radius of the required curve is $\frac{1}{2}C \sec \alpha \sqrt{a^2 + b^2 - 2ab \cos \alpha}$
5. 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. How the transition curve be set out. Explain.

6. The top (Q) of a chimney was sighted from two stations P and R at very different levels, the stations P and R being in the line with the top of the chimney. The angle of elevation from P to the top of the chimney was $38^{\circ}21'$ and that from R to the top of the chimney was $21^{\circ}18'$. The angle of elevation from R to a vane 2 m above the foot of the staff held at P was $15^{\circ}11'$. The heights of the instrument at P and R were 1.87 m and 1.64 m respectively. The horizontal distance between P and R was 127 m and the reduced level of R was 112.78 m. find the R.L. of the top of the chimney and the horizontal distance from P to the chimney.
7. (a) What are the factors that affect the selection of triangulation stations?
(b) What are the various correction for the base line. Discuss in brief.
8. Adjust the angles α and β , observations of which give
- | | |
|---|----------|
| $\alpha = 20^{\circ} 10' 10''$ | weight 6 |
| $\beta = 30^{\circ} 20' 30''$ | weight 4 |
| $\alpha + \beta = 500^{\circ} 30' 50''$ | weight 2 |
