

II B.Tech I Semester Regular Examinations, November 2006**SURVEYING****(Civil Engineering)****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions
All Questions carry equal marks**

1. (a) Give a detailed classification of Surveys.
- (b) A line 3.2 km long is measured with a steel tape which is 20m under no pull at 30°C. The tape in section is 1/8 cm wide and 1/20 cm thick. If one half of the line is measured at a temperature of 40°C and the other half at 50°C and the tape is attached to a pull of 200N, find the corrected total length of the line given the coefficient of expansion is 11.5×10^{-6} per degree C, weight of tape per Cubic cm of steel = 0.77504N, and $E = 2.1 \times 10^5 \text{ N/mm}^2$. [7+9]
2. (a) Explain the different methods of plotting a compass traverse.
- (b) The following are the bearings of a closed traverse. Find out which of the stations are affected by local attraction. Tabulate the corrected bearings of lines.

<u>Line</u>	<u>F.B</u>	<u>B.B</u>
AB	N50°30'W	S47°30'E
BC	N54°00'E	S53°00'W
CD	S3°30'E	N4°00'W
DE	S41°30'E	N41°30'W
EA	S79°30'W	N78°00'E

[8+8]

3. The following observations were made during the testing of a dumpy level:

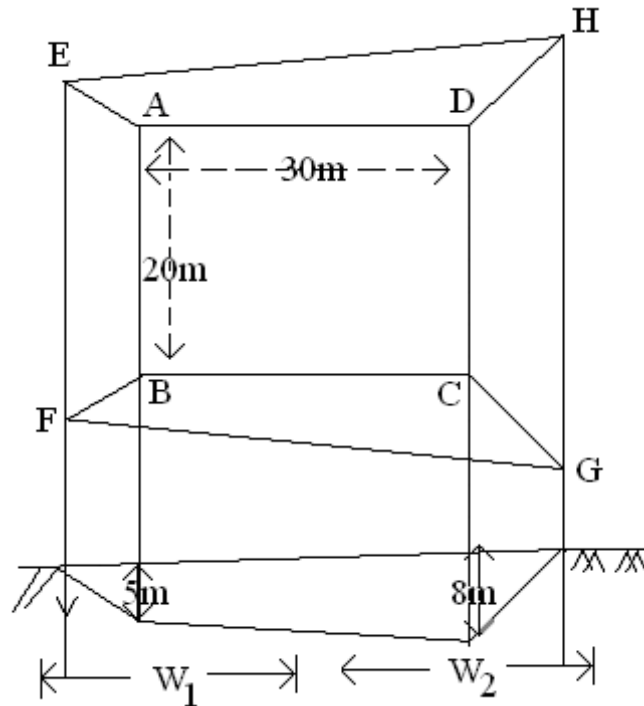
Instrument at	Staff reading on	
	A	B
A	1.702	2.244
B	2.146	3.044

Distance AB=150m Is the instrument in adjustment? To what reading should the line of collimation be adjusted when the instrument was at B? If the R.L of A=432.052, what should be the R.L. of B.

[16]

4. Calculate the volume of excavation shown in Figure 4, the side slope being 1½ horizontal to 1 vertical, and the original ground surface sloping at 1 in 10 the direction of the center line of excavation. AB = CD = 20m and BC = AD = 30m.

[16]



5. (a) Write briefly the procedures for the measurement of
 - i. Direct angles
 - ii. Magnetic bearings
 - iii. Deflection angles. [10]
- (b) What are the various instrumental errors in a theodolite? How would you minimize them? [6]
6. (a) Explain different systems of tacheometry and discuss their relative merits. [8]
- (b) The vertical angles to vanes fixed at 1.525 m and 2.925 m above the foot of the staff held vertically at a station A, were $+4^{\circ}15'$ and $+5^{\circ}30'$, respectively, Determine the horizontal distance and reduced level of A if the height of the instrument axis is 140 m above datum. [8]
7. (a) What are the elements of a simple circular curve. Give their relationships. [7]
- (b) Two roads meet an angle of $127^{\circ}30'$. Calculate the necessary data for setting out a curve of 15 chains radius to connect two straight portions of the road if it is intended to set out the curve by chain and offsets only. Take length of chain as 30m [9]
8. (a) What is Geodetic Surveying? How it is different from Plane surveying [8]
- (b) Explain the importance of electronic surveying in the field of surveying [8]

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1. (a) Describe plane Table intersection method with the help of neat sketches. Under what circumstances this method is resorted to.
- [8+8]
- (b) Explain the various sources of errors in plane Table Surveying.
2. (a) What are the essential differences between chain Survey and compass Survey. Under what circumstances compass Survey is preferred to other types of Surveys.
- (b) Find which station is free from local attraction and work out the correct bearings.

<u>Line</u>	<u>F.B</u>	<u>B.B</u>
AB	191°45'	13°00'00"
BC	39°30'	222°00'30"
CD	22°15'	200°30'00"
DE	242°45'	60°45'00"
EA	330°15'	147°45'00"

[8+8]

3. (a) What are the permanent adjustment of levels?
- (b) Explain the principle of "reversion".
- (c) Name the principal lines in a dumpy level. List the conditions of adjustments.
- [4+4+8]
4. (a) List the general methods of calculating are as,
- [4]
- (b) Explain any one methods giving its advantages, limitation and suitability for a given type of work
- [12]
5. (a) Discuss the relationships between the various axes of a transit.
- [4]
- (b) What are the different types of errors which can occur in theodolite surveying? How would you avoid them?
- [12]
6. Derive an expression for the horizontal distance of a vertical staff from a tacheometer, if the line of sight is inclined.
- [16]
7. (a) What are the usual difficulties in ranging simple curves and how are they obviated.
- [8]
- (b) Calculate the ordinates from a 150m long chord at 10m interval to set out a simple circular curve of 8°
- [8]

Code No: R050210103

Set No. 2

8. (a) What is Geodetic Surveying? How it is different from Plane surveying [8]
(b) Explain the importance of electronic surveying in the field of surveying [8]

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1. (a) Describe plane Table Radiation method with the help of a neat sketch. Under what circumstances this method is resorted to.
- (b) Discuss the advantages and disadvantages of plane table Surveying over other methods of Surveying. [8+8]

2. (a) Explain the different methods of plotting a compass traverse.
- (b) The following are the bearings of a closed traverse. Find out which of the stations are affected by local attraction. Tabulate the corrected bearings of lines.

<u>Line</u>	<u>F.B</u>	<u>B.B</u>
AB	<i>N50°30'W</i>	<i>S47°30'E</i>
BC	<i>N54°00'E</i>	<i>S53°00'W</i>
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EA	<i>S79°30'W</i>	<i>N78°00'E</i>

[8+8]

3. List the advantages and disadvantages of an internal focusing telescope. Briefly describe it. [16]
4. (a) Name the three methods of measuring volume. For what purpose each one of these is use ? [6]
- (b) Explain the measurement of volume from cross sections. [10]
5. (a) Describe the various types of Theodolite. [8]
- (b) How would you measure a horizontal angle by reiteration method? [8]
6. (a) Differentiate between the fixed hair method and movable hair method. Discuss advantages and disadvantages of each method. [8]
- (b) Determine the distance between the points P and Q from the following data:
 R.L. of tacheometer axis at P= 185.300 m
 Vertical angle at P= - 4°35'
 Staff readings at Q= 1.440, 0.900, 0.360
 Also determine the R.L. of Q. The staff at Q was held vertical, and $k=100$ and $c=0.00$ [8]
7. (a) Why are the curves provided. Explain different types of curves with neat sketches. [7]

- (b) Two straights intersect at a chainage of 3500.5m with an angle of intersection of 156^0 . These two straights are to be connected by a simple circular curve of 200m radius. Calculate the data necessary by the method of offsets from the chords produced with a peg interval of 20m. Explain the procedure to set out the curve. [9]
8. (a) Define geographic information system and describe the relationship between traditional analog map and Geographic Information System. [8]
- (b) Suggest possible users of a GIS and how it might benefit them. [8]

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1. (a) a) Explain clearly the points of difference between the prismatic compass and Surveyor's compass.
(b) What are the sources of errors in compass Surveying and what precautions are to be taken to eliminate them. [8+8]
2. (a) Explain compensating and cumulative errors in chain Surveying.
(b) What are the Survey stations. How will you select them.
(c) A Survey line CD intersects a high building. To prolong the line beyond this obstacle, a perpendicular DE, 200m long is set out at D. From E, two lines EF and EG are set out at angles of 45^0 and 60^0 with ED respectively. Determine the length of EF and EG in order that the points F and G may lie on the prolongation of CD, and also find the obstructed length DF. [4+4+8]
3. (a) Explain the adjustment of "Cross - Hair Ring".
(b) What is the desired relation, object and necessity of adjusting the cross- hair ring? [8+8]
4. (a) List the methods of calculating are as from offsets to a base-line. [2]
(b) Explain the trapezoidal rule. [10]
(c) How does the trapezoidal rule compare with other rules. [4]
5. (a) Describe the various types of Theodolite. [8]
(b) How would you measure a horizontal angle by reiteration method? [8]
6. (a) Discuss the advantages of tacheometric surveying over other methods [8]
(b) The following observations were taken with a tacheometer at the station P to a staff at Q held normal to the line of sight. If the staff readings are 1.71, 2.64, and 3.57m and the angle of inclination is $29^030'$ determine the horizontal distance between P and Q
Also determine the elevation of Q, if the instrument axis is R.L. of 200.00.
Take $k=100$ and $C=0.50$ [8]
7. (a) Describe the method of setting out a simple circular curve using two Theodolites.- [8]
(b) Two roads meet at angle of $127^030'$. Calculate the necessary data for setting out a curve of 450m radius to connect two straight portions of the road if a Theodolite is available. [8]

Code No: R050210103

Set No. 4

8. (a) What is Geodetic Surveying? How it is different from Plane surveying [8]
(b) Explain the importance of electronic surveying in the field of surveying [8]
