

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0023

Roll No.

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B.Tech.**(SEMESTER-III) THEORY EXAMINATION, 2012-13****SURVEYING – I****Time : 2 Hours]****[Total Marks : 50**

Note : The question paper contains three sections – A, B and C with weightage of 10, 16 & 24 respectively. Follow the instructions as given in each section.

Section – A

1. Attempt **all** parts of this question. Give your answer in brief : **1 × 10 = 10**
- Define surveying. What are principles of surveying ? Explain them briefly.
 - Briefly describe the process of chaining.
 - Differentiate between chainage and offset.
 - Why it is desirable to plot maps with true bearings rather than with magnetic bearings ?
 - Sketch the fundamental lines of Theodolite. State the direct relationship between them.
 - How is closing error of a traverse adjusted graphically ?
 - Describe the two-peg method of permanent adjustment of a Dumpy level.
 - Explain how a subtense bar is used to determine horizontal distances.
 - Define a contour. State the various characteristics of contour lines.
 - What are essential requirements of a transition curve ?

Section – B

2. Attempt any **four** parts. All parts carry equal marks : **4 × 4 = 16**
- Discuss briefly the different types of errors in surveying.
 - An offset is laid 4° out from its true direction in the field. Find the resulting displacement of plotted point on the plain for following cases, if the offset measured was 8.0 m and scale of plotting was 6 m to 1 cm :
 - On direction parallel to chain line
 - In direction perpendicular to the chain line

- (c) Differentiate between following :
- Bearing & azimuth
 - Magnetic & true meridian
- (d) What is meant by face left and face right of a theodolite ? How would you change face ? What instrumental errors are eliminated by face left and face right observations ?
- (e) In a quadrilateral ABCD, the coordinates of points (in metres) are as follows :

Point	East	North
A	0	0
B	0	-893.8
C	634.8	728.8
D	1068.4	699.3

Find the area of figure.

- (f) Discuss in detail the methods of direct and indirect contouring.

Section – C

3. Attempt any **three** parts. All parts carry equal marks. **8 × 3 = 24**

- (a) A road 8 m wide is to deflect through an angle of 60° with the centre line radius of 300 m, the chainage of intersection point being 3605.0 m. A transition curve is to be used at each end of circular curve of such a length that rate of gain of radial acceleration is 0.5 m/s^3 , when speed is 50 km/h. Find out
- Length of transition curve
 - Superelevation
 - Chainage of all junction points
 - Offsets at $X = L/4, L/2, \frac{3L}{4}$ & L
- (b) Find upto which vertical angle, in stadia work, a sloping distance may be assumed to be horizontal so that the error may not exceed 1 in 300 ? The instrument is fitted with an anallatic lens and staff is held vertical.
- (c) A closed traverse has following lengths and bearings :

Line	Length (m)	Bearing
AB	200.0	Roughly East
BC	98.0	178°
CD	Not-obtained	270°
DA	86.4	1°

The length CD could not be measured due to some obstructions to chaining. The bearing of AB could not be taken, as station A is badly affected by local attraction. Find the exact bearing of the side AB & calculate length CD.

- (d) The following bearings were taken while conducting a close traverse with a compass in a place where local attraction was suspected :

Line	F.B.	B.B.
AB	$80^{\circ}45'$	$260^{\circ}00'$
BC	$130^{\circ}30'$	$311^{\circ}35'$
CD	$240^{\circ}15'$	$60^{\circ}15'$
DA	$290^{\circ}30'$	$110^{\circ}10'$

At what stations do you suspect local attraction ? Find the corrected bearings for local attraction and for declination of $1^{\circ} 30' \text{ N}$.

- (e) The distance measured between two points on a sloping ground is 450 m. Find correction to be applied and horizontal distance if :
- (i) The angle of slope is 10°
 - (ii) The slope is 1 in 5.
 - (iii) The difference in elevation between two points is 45 m.

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