

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

**PAPER ID : 0023**

Roll No.

--	--	--	--	--	--	--	--	--	--

**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  $4^\circ$  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  $60^\circ$  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  $0.5 \text{ m/s}^3$ , 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	$178^\circ$
CD	Not-obtained	$270^\circ$
DA	86.4	$1^\circ$

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°45'	260°00'
BC	130°30'	311°35'
CD	240°15'	60°15'
DA	290°30'	110°10'

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

- (e) The distance measured between two points on a sloping ground is 450 m. Find correction to be applied and horizontal distance if :
- The angle of slope is  $10^{\circ}$
  - The slope is 1 in 5.
  - The difference in elevation between two points is 45 m.

StudentSuvividha.com