4TH SEM ./ CIVIL./ 2023(S)

TH-3 LAND SURVEY - I

Full Marks: 80 **Time- 3 Hrs**

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

   a. Name different types of chain, which are used in surveying.

   b. What is local attraction and how it is detected?

   c. What is the principle of chain surveying?

   d. Draw the conventional symbol of temple and level crossing.

   e. What is cadastral surveying?

   f. What is the least count of a transit theodolite?

   g. What is temporary bench mark?

   h. When do you apply resection method in plane table surveying.

   i. What are the sources of error in chain surveying?

   j. Define line of collimation.

2. Answer **Any Six** Questions 6 x 5

   a. Explain the errors in chaining.

   b. The bearings were observed during traversing 182°35’ and 126°30’. If the declination at the place is known to be 1°40’ E. Then find the bearings of the line.

   c. A steel tape 20m long, standardised at 15°C with a pull of 10kg was used to measure distance along a slope of 4°25’. If the mean temperature during the measurement was 10°C and pull applied 16kg, determine the correction required per tape length. Assume coefficient of expansion = $112X10^{-7}$per °C, cross sectional area of tape = $0.08cm^2$ and Young’s Modulus E = $2.1X10^6 kg/cm^2$.

   d. Distinguish between rise fall method and height of instrument method.

   e. Write down the different characteristics of contours.

   f. Define W.C.B. and Q.B in compass surveying.

   g. Write the Bowditch rule for balancing a traverse.

3 The following offsets were taken from a chain line to a hedge: 10

Distance in meter	0	10	20	30	40	60	80	100	120	140	160
Offset in meter	0	2	2.5	2.2	3	3.4	2.8	2.6	3.2	2.9	2.7

4 What are different methods of plane tabling? Describe any one method in detail. 10

5 The following observations were made during the testing of a level. 10

Instrument at	Staff reading at station	
	A	B
A	1.225	1.375
B	0.850	0.500

RL of station A is known to be 356.5. Calculate the RL of station B. Also calculate the error in line of collimation and state clearly whether it is inclined upwards or downwards.

6 Find the area of closed traverse by calculation of area by co-ordinate method. 10

Line	Latitude	Departure
AB	+225.5	+120.5
BC	-245.0	+240.0
CD	-180.5	-140.5
DA	+200.0	-220.0

7 The bearings observed at the stations of a closed traverse are given below. 10
Check whether the bearings are correct. If not, correct the bearings.

Line	F.B.	B.B.
AB	122°15’	302°15’
BC	66°00’	243°45’
CD	308°15’	133°00’
DA	198°00’	15°30’