

4<sup>TH</sup> 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  $182^{\circ}35'$  and  $126^{\circ}30'$ . If the declination at the place is known to be  $1^{\circ}40'$  E. Then find the bearings of the line.
  - c. A steel tape 20m long, standardised at  $15^{\circ}\text{C}$  with a pull of 10kg was used to measure distance along a slope of  $4^{\circ}25'$ . If the mean temperature during the measurement was  $10^{\circ}\text{C}$  and pull applied 16kg, determine the correction required per tape length. Assume coefficient of expansion =  $112 \times 10^{-7}$  per  $^{\circ}\text{C}$ , cross sectional area of tape =  $0.08\text{cm}^2$  and Young's Modulus  $E = 2.1 \times 10^6 \text{kg/cm}^2$ .
  - 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'