4TH SEM./CIVIL ENGINEERING/ 2022(S)

TH3 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. What is Simpson's rule for calculation of area in survey?

b. What is parallax?

c. Define latitude and departure of a survey line

d. What is the principle of reciprocal levelling?

e. What is meant by unique identification number of parcel in map preparation?

f. Why optical square is used in surveying?

g. What is a field book? What are the types of field books?

h. Convert the following WCBs to QB
   a. $160^0\ 25'$
   b. $285^0\ 30'$
   c. $15^0\ 45'$
   d. $203^0\ 30'$

i. Define isogonic and agonic lines.

j. Why well conditioned triangles are preferred in chain surveying?

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

a. Enlist and explain the function of each instrument used in plane table surveying with neat sketch.

b. Explain about cadastral map preparation methodology.

c. The following offsets were taken from a chain line to an irregular boundary line at an interval of 10m:
   0, 2.50, 3.50, 5.00, 4.60, 3.20, 0m
   Compute the area between the chain line, the irregular boundary line and the end offsets by (a) The mid-ordinate rule & (b) The trapezoidal rule.

d. Explain the procedure to set out an angle of $30^0\ 40'\ 13''$ with theodolite.

e. A 30m steel tape was standardised at a temperature of 20^0 C and under a pull of 5 kg. The tape was used in catenary at a temperature of 25^0 C and under a pull of 11 kg. The cross sectional area of tape is 0.02 cm^2 and its total weight is 660 gm. Find the correct horizontal distance. Take $E=2\times10^6 kg/cm^2$ & $\alpha=11\times10^{-6}/\ ^\circ C$.

f. Explain about characteristics of contours with neat sketch.

g Differentiate between Surveyor Compass and Prismatic Compass.

3 Explain the procedure for solving two point and three point problems in plane table surveying. 10

4 The following bearings were observed in traversing with a compass in an area where local attraction was suspected. Find the stations affected with local attraction and calculate the correct bearings of lines. 10

Line	FB	BB
AB	68^0 15′	248^0 15′
BC	$148^0$45′	326^0 15′
CD	$224^0$30′	$46^0$00′
DE	217^0 15′	38^0 15′
EA	$327^0$45′	$147^0$45′

5 Explain the procedure of chaining to overcome an obstacle where chaining is obstructed but vision is free. 10

6 Write the procedure for finding area using Latitude and Double Meridian Distance method and find out the area of a closed traverse considering following data by Latitude and DMD method 10

SIDE	LATITUDE	DEPARTURE
AB	+225.5	+120.5
BC	-245.0	+210.0
CD	-150.5	-110.5
DA	+170.0	-220.0

7 The following consecutive readings were taken with a dumpy level along a chain line at a common interval of 15m. 10

3.150, 2.245, 1.125, 0.860, 3.125, 2.760, 1.835, 1.470, 1.965, 1.225, 2.390, and 3.035m.

The first reading was at a chainage of 165m where RL is 98.085. The instrument was shifted after the fourth and ninth readings. Find RL of all points using rise-and-fall method.