

SE Civil - IV e-scheme

15.5.23

40 + 40 + 20

Time: 3 hours

Max Marks: 80

Question 1 is compulsory

Attempt any three from remaining

Assume suitable data wherever necessary and mention it clearly.

Figures to the write indicate full marks.

Attempt sub questions in order.

1. Write a brief note on any four of the following

- Ranging and types of ranging (05)
- Characteristics of contour lines (05)
- Fundamental lines or axes of a theodolite. (05)
- Working principle of EDM and its uses in Surveying. (05)
- Necessity and types of curves. (05)

2a. Explain the terms contour interval and horizontal equivalent (05)

b. Differentiate between Prismatic and Surveyor compass. (05)

c. Bearings observed in a compass travers with a compass are given below. Find the station affected by local attraction and correct the bearings. Also find the true bearings of the lines if the magnetic declination is $4^{\circ} 30' W$. Tabulate the corrected bearings. (10)

Line	Fore Bearing	Back Bearing
AB	$305^{\circ} 00'$	$125^{\circ} 30'$
BC	$75^{\circ} 30'$	$254^{\circ} 30'$
CD	$115^{\circ} 30'$	$297^{\circ} 00'$
DE	$165^{\circ} 30'$	$345^{\circ} 30'$
EA	$225^{\circ} 00'$	$44^{\circ} 00'$

3 a. Discuss in detail about the field procedure of profile levelling and cross sectioning with necessary diagrams. (10)

b. Determine the missing data. Apply usual checks. (10)

Station	B.S.	I.S.	F.S.	Rise	Fall	H.I.	RL(m)
1	?					23.18	20.00
2		1.59		?			?
3	0.28		?		1.08	?	?
4	?		4.00		?	18.33	?
5		?			2.19		?
6	?			?			15.72
7			2.95		?		?

4. a. Following data belongs to a theodolite traverse. Balance the traverse using transit rule. (05)

Line	Length	Latitude	Departure
AB	300.00	+129.56	+4.52
BC	147.60	+17.27	+299.58
CD	307.20	-147.53	+4.94
DA	129.60	0	-307.20

b. Explain temporary adjustments of a transit theodolite. (5)

c. Discuss the difficulties in chaining. (5)

Following offsets were taken from a chain line to an irregular boundary. (5)

d. Calculate the area enclosed by the chain line, the irregular boundary and the offsets using Simpson's rule & trapezoidal rule:

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Distance in m	0	6	12	18	24	36	48	60	72
Offset in m	3.8	3.0	2.9	1.8	1.6	1.6	1.5	1.8	3.2

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- Explain the different methods used for orientation of plane table. (5)
 - Discuss the function and components of GPS. (5)
- Following observations were made on a vertically held staff with a tacheometer set up on an intermediate point on a straight-line CD. The instrument was fitted with an anallatic lens and had a multiplying constant as 100. Compute the length CD and the RL of D. RL of C is 527.63m (10)

Staff station	Vertical Angle	Staff intercept	Axial hair reading
C	+8° 36'	2.880	2.505
D	-8° 36'	1.655	2.850

- 6.
- Explain methods of tacheometry and its suitability. (05)
 - Discuss the procedure for setting out deflection angle using theodolite. (5)
 - Tabulate the necessary data for setting out a simple circular curve with the following data. Angle of intersection = 144°; chainage of point of intersection = 1390m.; Radius of the curve = 300m. The curve is to be set out by offsets from chords produced with pegs at every 20m throughout the chainage. (10)