

S.E./Civil/ Sem-IV / CBCGS/R-19 / 'C' Scheme / Subj-Surveying / S.H. 2024
Date: 09/12/2024

Time: 3 Hours

Maximum Marks: 80

Notes:

QP. Code: 10067309

1. Question No. 1 is compulsory.
2. Attempt any three out of remaining 5 Questions.
3. Figures to the right indicate full marks.
4. Assume suitable data if required.

Q.1 Attempt any **FOUR** of the following

- a. State Characteristics of contour Lines. 05
- b. Explain repetition method of determination of horizontal angle using theodolite. 05
- c. A 30 m chain was found to be 10 cm too short after a chaining of 1450 m. It was 14 cm too short after a chaining of 2650 m. If the chain was correct before the commencement of work, Find the true distance between two points. 05
- d. Explain types of horizontal and vertical curves used in Highways. 05
- e. Draw neat labelled sketch of Prismatic compass showing all components. 05

Q.2 Attempt the following Questions

- a. Survey was conducted around a lake and bearing was obtained as follows. Determine which station are affected by local attraction and gives values of the corrected bearings. Also find true bearing if declination is $5^{\circ}10'$ E 10

Line	Fore Bearing (F.B.)	Back Bearing (B.B.)
AB	$75^{\circ}5'$	$254^{\circ}20'$
BC	$115^{\circ}20'$	$296^{\circ}35'$
CD	$165^{\circ}35'$	$345^{\circ}35'$
DE	$224^{\circ}50'$	$44^{\circ}5'$
EA	$304^{\circ}50'$	$125^{\circ}5'$

- b. State different uses of surveying. 5
- c. Explain methods of orientation of plane table with neat sketch. 5

Q.3 Attempt the following Questions

- a. State and explain different accessories used in plane table surveying with neat sketch 5
- b. Write short note on Reciprocal levelling. 5
- c. An incomplete traverse table is obtained as follows: 10

Line	Length (m)	Bearing
AB	100	?
BC	80.5	$140^{\circ}30'$
CD	60	$220^{\circ}30'$
DA	?	$310^{\circ}15'$

Calculate the length of DA and bearing of AB.

Q.4 Attempt the following Questions

- a. The following perpendicular offsets were taken by a chain line to a hedge:

10

Chainage (m)	0	15	30	45	60	70	80	100	120	140
Offset (m)	7.60	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

Calculate the area between the survey line and the offset by (a) Trapezoidal Rule and (b) Simpson's Rule

- b. The following readings are successively taken with a level:

10

0.355, 0.485, 0.625, 1.755, 1.895, 2.350, 1.780, 0.345, 1.230, 2.345, 3.125, 0.545, 1.390, 2.055, 2.955.

The instrument was shifted after the 4th, 7th and 11th staff reading. Prepare a page of level book and calculate the RL's of different points. Also apply necessary check. Reduced level of first point is 255.500 m.

Q.5 Attempt the following Questions

- a. A tacheometer is set up at an intermediate point 'O' on a traverse PQ and the following observations are made on vertical staff.

10

Staff Station	Vertical Angle	Staff Intercept	Axial Hair reading	Remark
P	+8° 36'	2.350	2.105	RL of P = 321.50 M
Q	+6° 6'	2.055	1.895	

The instrument is fitted with anallactic lens with multiplying constant 100. Calculate the length of PQ & RL of Q. Also calculate elevation difference between stations P & Q.

- b. State fundamental axis of theodolite and interrelationship between them

5

- c. Explain different uses of total station.

5

Q.6 Attempt the following Questions

- a. Explain in detail Road Project with neat sketches.

10

- b. Tabulate the data required for setting out a curve by deflection angle method by considering the following information

10

1. Angle of Intersection: 145°
2. Chainage of point of intersection: 1580.
3. Degree of curve: 5°.
4. Least count of theodolite: 20".
5. Peg Interval: 30 m.