

- N. B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **three** questions out of remaining questions.
 (3) Illustrate answers with neat sketches wherever required.
 (4) Attempt subquestions in order.
 (5) Assume any suitable data, if required and state the same clearly.

1. Attempt any **four** questions :-

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- (a) Explain cumulative and compensating errors in chaining.
 (b) Describe temporary adjustment of prismatic compass.
 (c) Explain the reciprocal levelling and state its advantages.
 (d) Differentiate between consecutive co-ordinate and independent coordinate.
 (e) Explain the characteristics of contour lines.
 (f) Explain geodetic surveying.

2. (a) Write short notes on compound levelling and profile levelling.

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(b) A chaining pass a pond, stations P and Q were selected on opposite side of the pond. A line PA, 200 m long, was set out on the left of PQ, and a line PB was set out on the right such that A, Q and B are collinear. The length of PB was 250m. The length of AQ and QB were measured to be 125 m and 150 m respectively. The chainage at P is 1020.55 m. Calculate the chainage of Q.

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(c) The following bearings were observed while traversing with compass. Find which stations are affected by local attraction and work out corrected bearings of the lines of a closed traverse.

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Line	F.B.	B.B.
AB	191°30'	13°0'
BC	69°30'	246°30'
CD	32°15'	210°30'
DE	262°45'	80°45'
EA	230°15'	53°00'

3. (a) Write exhaustive note on "obstacles in chaining".

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(b) Explain the various type of bench marks used in levelling.

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(c) The following staff reading were observed with a level & a 4 m staff on a continuously sloping ground at a common interval of 15 m. The readings are 0.880, 1.635, 2.055, 2.530, 3.085, 3.580, 1.255, 2.060, 2.465, 3.740, 1.035, 1.145, 1.730 and 2.645. The reduced level of the first point was 780.150. Rule out a page of a level-book and enter the above reading. Calculate the reduced levels and the gradient of the line joining the first & last points. 10

- (a) Define two point problem & explain how it can be solved on field. 8
 (b) Balance the following closed traverse by transit rule and also compute the closing error? 12

Line	Lat (m)	Dep (m)
AB	-173.20	100.00
BC	- 314.50	128.40
CD	86.60	50.00
DE	250.00	0.00
EA	154.90	- 280.00

5. (a) Explain the method of measuring and recording horizontal angle by repetition method using transit? 10
 (b) The following offsets were taken from a chain line to a hedge. 10

Distance (m)	0	5	12	18	24	36	48	60	72	81	90
Offset (m)	3.8	3.3	2.4	1.8	0.9	1.5	1.8	2.2	3.0	3.3	3.6

Calculate the area enclosed between the chain-line, the hedge and the end-offsets by Simpson's rule & trapezoidal rule.

6. Write short notes on any four :- 20

- Hypotenusal allowance
- Types of variations
- Sources of error in levelling
- Spire test
- Orientation in plane table surveying.