

**(OLD COURSE)**

(3 Hours)

[ Total Marks :100

- N. B. :**
- (1) Question No. 1 is **compulsory**.
  - (2) Attempt any **four** questions out of remaining **six** questions.
  - (3) Assume any **data** if **required** and state them **clearly**.
  - (4) **Figures** to the **right** indicate **full** marks.
1. (a) What is Ranging ? Discuss method of Reciprocal ranging. 5  
 (b) Explain fly levelling with its suitability. 5  
 (c) Discuss characteristics of Contour lines with neat sketches. 5  
 (d) How will you measure deflection angle of a survey line using theodolite? 5
  2. (a) What are Scales ? Discuss diagonal scale with neat sketch. 5  
 (b) Explain the temporary adjustments of a level. 5  
 (c) The staff readings taken during a levelling operation are given below. The instrument was shifted after the 5<sup>th</sup>, 10<sup>th</sup>, 14<sup>th</sup> and 19<sup>th</sup> readings. 10  
 1.355, 1.605, 2.125, 0.685, 1.365, 2.015, 1.355, -1.385, 0.685, 2.105, 1.685, 1.155, 1.105, 2.015, 1.085, 1.345, 1.355, -2.015, 1.305, 1.655, 1.685, 1.455.  
 Arrange the data in tabular form and find R.L. of the points if the 12<sup>th</sup> reading was taken on a benchmark of RL 185.635.
  3. (a) A 30 mt chain used to measure the length of a line was tested before the line was measured and found to be 29.95 m long. The line was measured and the length was recorded as 590.48 m . The chain was tested again and found to be 30.08 m long. Find the true length of the line. 5  
 (b) What is orientation in plane table survey? And explain the methods of orientation in brief. 5  
 (c) The following bearings are observed while traversing with a compass and tape. 10  
 Calculate the bearings for local attraction correct the bearings by the method of included angles.
 

AB : 188° 45'	BA : 7° 45'
BC : 118° 15'	CB : 298° 15'
CD : 346° 35'	DC : 166° 30'
DE : 337° 05'	ED : 158° 10'
EA : 293° 30'	EA : 113° 00'
  4. (a) Explain the process of measuring horizontal angle between two points using repetition method of theodolite traversing. 5  
 (b) Define : – (i) Level surface 5  
 (ii) Line of Collimation  
 (iii) Axis of telescope  
 (iv) Axis of bubble tube  
 (v) Sensitivity of bubble

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(c) For a given traverse, find length of CD and bearing of EA. 10

Line	Length (mt)	Bearing
AB	178.6	S 52' 34' E
BC	228.6	N 48' 45' E
CD	—	N 18' 15' W
DE	126.7	S 78' 30' W
EA	238.8	—

5. (a) Eleven offsets was taken from a chain line to a curved boundary at 10-mt intervals and the lengths of the offsets from the left end are (in mt) 3.8, 5.1, 6.5, 6.8, 5.9, 6.2, 7.0, 6.6, 5.8 and 4.2. Determine the area between the chain line, the curved boundary and the first and last offesets by applying Trapezoidal rule and the Parabolic rule. 5

(b) Explain with neat sketch clip of a magnetic needle. 5

(c) Explain in detail different types of obstacles in levelling. 10

6. (a) Differentiate between Prismatic and Surveyors Compass. 5

(b) Define two-point problem in plane table survey. Explain the field procedure to solve the same. 5

(c) The following readings refer to the reciprocal levelling taken between stations P and Q. Find the true difference in elevation between P and Q. If the instrument had a collimation error of 0.003 / 150 m and the distance between stations was 1150 m, find the error due to refraction. 10

Inst at	Staff Readings at	
	P	Q
P	1.425	2.724
Q	1.429	2.504

7. Write short notes on any **four** : — 20

- (a) Gales Traverse Table
- (b) Difference between WCB and Q.B
- (c) Permanent Adjustments of Level
- (d) Bearing and its Types
- (e) Advantages of Plane Table Survey
- (f) Balancing F.S and B.S.

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