

SURVEYING – I
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What are the duties of surveyor?
 - (b) Define the survey line and check line.
 - (c) List out the instrumental errors in compass surveying.
 - (d) Define the terms radiation and resection used in plane table surveying.
 - (e) What is meant by back sight and turning point in leveling?
 - (f) What are the factors should be considered for selecting the contour intervals?
 - (g) List out the main parts of vernier theodolite.
 - (h) What are the checks in closed traverse?
 - (i) How do you determine the capacity of reservoir from contour plan?
 - (j) What is principle and use of an optical square?

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) What are the different types of errors? Illustrate your answer for the case of linear measurements with tape.
- (b) The plan of an area has shrunk such that a line originally 10 cm now measures 9.5 cm. If the original scale of the plan was 1 cm = 10 m (R.F = 1:1000). Determine: (i) The shrinkage factor. (ii) Shrunk scale. (iii) Correct scale corresponding to a measure distance of 9 m. (iv) Correct area corresponding to a measured area of 10,000 m².

OR

- 3 (a) How would you overcome the chainage problem, if there are obstacles on the chain line, assume that the chainage round the obstacle is possible?
- (b) A and B are two points on the opposite sides of a pond. The surveyor establishes a line AC clear of the pond such that B is visible from C. He establishes another point D on the line CB produced so that the line AD is also clear of the pond. If the distances AC, CB, BD and DA are 300 m, 150 m, 175 m and 250 m respectively. Determine the distance AB.

UNIT – II

- 4 Three ships A, B and C started sailing from Chennai at the same time in three directions. The speed of all three ships was 30 km/hr. Their bearings were measured to be N 70° E, S 60° E and S 10° E. After an hour, the captain of ship B determined the bearings of the other two ships with respect to his own ship. After that he found out the distances. Calculate the value of bearings and distances which might have been determined by the captain of ship B.

OR

- 5 What is two point problem? Describe the procedure in detail.

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UNIT – III

- 6 The following readings were observed successively with a levelling instrument. The instrument was shifted after fifth and eleventh readings. (i) 0.585. (ii) 1.010. (iii) 1.735. (iv) 3.295. (v) 3.775. (vi) 0.350. (vii) 1.30. (viii) 1.795. (ix) 2.575. (x) 3.375. (xi) 3.895. (xii) 1.735. (xiii) 0.635. (xiv) 1.605. Draw up a page level book and determine the R.L of various points on which the first reading was taken is 136.440. Use the rise and fall method.

OR

- 7 (a) Discuss the characteristics of contours along with suitable sketches
(b) If the sensitivity of the bubble tube of a level is $30''$ of arc per division. Determine the distance of point at which the combined curvature and refraction correction become numerically equal to the error induced by displacement of one division of the level tube.

UNIT – IV

- 8 (a) Describe briefly temporary adjustments of theodolite.
(b) Explain any one method of establishing a line beyond an obstruction.

OR

- 9 Following table gives data of consecutive coordinates in respect of closed theodolite traverse ABCDA.

station	N	S	E	W
A	300.75			200.00
B	200.25		299.25	
C		299.00	199.75	
D		200.00		300.50

From the above data, calculate: (i) Magnitude and direction of closing error. (ii) Corrected consecutive coordinates of station B using transit rule. (iii) Independent coordinates of station B if those of are (100, 100).

UNIT – V

- 10 (a) The dimensions of two sections of road embankment are as under :

Section A	-6.50 /22.50	-7.30 /0.0	- 10.0/30.00
Section B	- 7.00/28.00	-11.0/0.0	12.50 /39.50

The distance between sections A and B is 100m. The formation width increases uniformly from 20 m at section A to 28 m at section B. Calculate the volume of the earth work by prismoidal formula.

- (b) Explain, with neat sketch working of tangent clinometers.

OR

- 11 (a) The straight road is to be formed long hill side having a uniform lateral slope of 10 horizontal to 1 vertical. The formation width is 30 m with side slopes 1:1 in cutting and 2:1 in filling. Calculate the total volume of earth work in a length of 450 m, if the areas of cut and fill in each cross-section are equal.
(b) Write short notes on sextant.
