

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
First Semester (2022-2023), Mid-Semester Test
Course: Surveying (CE F213)

Date: 4th Nov. 2022

Max. Marks: 60

Duration: 9:00 AM-10:30 AM

Q.1. (a) Derive the sag correction formula for chain, in chain surveying. [8]

(b) While passing an obstacle in the form of a pond, stations A and D, on the main chain line, were taken on the opposite sides of a pond. On the left of AD, a line AB, 250 m long, was laid down and a second line AC, 320 m long was, ranged on the right of AD, the point B, D and C are in the same straight line. BD and DC were then chained and found to be 155 m and 100 m respectively. Find the length of AD. Find the angle the line AD makes with line BDC. [7]

Q.2. In a levelling operation, the following observations are taken with the auto level. All the reading are in m. While taking the observations, the instrument is changed after 5th, 9th and 13th readings. Take the RL of the 1st station as 200m.

2.235, 1.920, 1.455, 0.550, -1.875, -1.985, 1.650, 2.350, 1.355, 1.995, 1.540, 1.355, 1.345, 2.250 and 2.115

Find the R.L.s of all the stations using height of instrument method. Perform all checks. [12]

Q.3. In the reciprocal levelling operation derive the expression for difference in elevation between two staff stations and the expression for total error. Also explain how to find the collimation error. [8]

Q.4. The fore bearing and back bearing of the lines in a traverse conducted with the prismatic compass is mentioned in the table. All the bearings are whole circle bearings. The local attraction and observation error is suspected. Using the included angle method find the correct bearings of the lines. [15]

Line	FB	BB
AB	35° 35'	213° 43'
BC	135° 18'	316° 10'
CD	200° 34'	19° 34'
DE	250° 36'	72° 39'
EA	320° 53'	141° 18'

Q.5. Explain 3 points and 2 points problems step wise in plane table surveying. [10]