

B.E. CIVIL ENGINEERING SECOND YEAR FIRST SEMESTER EXAM 2025**SUB: SURVEYING - I**

Time: 3 hours

Full Marks: 100

Part I (50 Marks)

Use separate answer scripts for each part

Q1. A closed traverse was conducted round an obstacle and the following observations were made. Work out the missing quantities: **[7]**

Side	Length (m)	Azimuth
AB	?	33°45'
BC	320	86° 23'
CD	?	169° 23'
DE	440	243° 54'
EA	268	317° 30'

Q2. The lengths, bearings, and included angles of a closed traverse ABCDA, as observed with a transit theodolite, are given below. Prepare a Gale's traverse table and plot the traverse. While preparing the traverse balance the traverse by Transit Rule and compute the independent co-ordinates of stations, given the co-ordinates of station B as (400 N, 200E). **[24]**

Line	Length (m)	W.C.B.	Included angle
AB	260	140°42'00"	∠A = 93°18'16"
BC	660		∠B = 74°16'25"
CD	125		∠C = 123°42'00"
DA	680		∠D = 68°41'16"

Q3. Calculate the correction for curvature, refraction and combined correction for a distance of: 8 km. **[3]**

Q4. Reciprocal levels were taken with a dumpy level and following observations were recorded: **[3]**

Instrument Station ↓	Staff reading at station ↓	
	A	B
A	1.850	1.570
B	0.750	0.500

R.L. of station A is known to be 625.055. Calculate the R.L. of station B.

[Turn over

Q5. Reproduced below is the page in a level book. Fill in the missing data. Apply usual checks. **[8]**

Station	B.S. (m)	I.S. (m)	F.S. (m)	Rise (m)	Fall (m)	R.L.	Remarks
1	3.025					?	B.M.1
2	?		?	1.325		125.005	T.P
3		2.320			0.055		
4		?				125.350	
5	?		2.655				T.P
6	1.620		3.205		2.165		T.P
7		3.625					
8			?			122.590	T.B.M

Q6. A tacheometer was set up at station A and the readings on a vertically held staff at B were 2.255, 2.605, and 2.955, the line of sight being at an inclination of $+ 9^{\circ}30'$. Another observation on vertically held staff at B.M. were 1.640, 1.920, and 2.200, the line of sight being at an inclination of $+ 1^{\circ}05'$. Calculate the horizontal distance between stations A and B, and the elevation of B if the R.L. of B if the R.L. of B.M. is 418.685 meters. The constant of the instrument is 100 and 0.2. **[5]**

B.E. CIVIL ENGINEERING SECOND YEAR FIRST SEMESTER EXAM 2024**Subject: SURVEYING I****Part - II****(50)****Use a separate Answer-Script for each part**

No.	Answer all the questions.	Marks															
1 (a)	A 30m long tape was standardized at 25°C and under a pull of 120N. A horizontal distance was measured with a pull of 130N applied to the tape at a temperature of 38°C. The tape was supported at the ends. Find the measured horizontal distance. Given, the cross-sectional area of the tape=6mm ² ; total weight of the tape=10N; α for steel=12x10 ⁻⁶ /°C; E for steel= 2.1x10 ⁵ N/mm ² .	[10]															
(b)	What are the two types of Surveying based on the survey area. Discuss any one type in details. [CO1]	[6]															
2 (a)	The bearings of a closed traverse are given. Check whether the bearings are correct. If not, correct the bearings by <i>Method of bearings</i> . <table border="1"><tr><td>Line</td><td>AB</td><td>BC</td><td>CD</td><td>DA</td></tr><tr><td>FB</td><td>74° 15'</td><td>107° 15'</td><td>224° 45'</td><td>307° 45'</td></tr><tr><td>BB</td><td>256° 00'</td><td>286° 15'</td><td>44° 45'</td><td>127° 00'</td></tr></table>	Line	AB	BC	CD	DA	FB	74° 15'	107° 15'	224° 45'	307° 45'	BB	256° 00'	286° 15'	44° 45'	127° 00'	[10]
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FB	74° 15'	107° 15'	224° 45'	307° 45'													
BB	256° 00'	286° 15'	44° 45'	127° 00'													
(b)	Explain the <i>two types of compass</i> used in compass surveying with a neat sketch. [CO2]	[6]															
3 (a)	Explain <i>Contour Interval</i> and <i>Horizontal Equivalent</i> with a neat sketch.	[4]															
(b)	The four points of a square ABCD having each side of 10m length have the elevations of 100m (A), 100.8m (B), 100.3m (C) and 99.5m (D). It is required to find contours at 100.4m, 100.5m and 100.7m between those points.	[8]															
(c)	With a neat sketch describe the <i>Two Point Problem of Method of Resection</i> in plane table surveying. [CO3]	[6]															