



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:IV
Class:SY	Program:B.Tech
Branch Code:CIV	Pattern:2023
Name of Course:Surveying	Course Code:2304212
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 3 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome of the Question/sub-question.

Marks CO

Question No. 1

1a) A closed traverse ABCDE was surveyed, and the following bearings were measured:

(6) CO1,
CO2

Line	FB	BB
AB	73° 54'	253° 24'
BC	22° 57'	201° 57'
CD	300° 0'	120° 45'
DE	228° 36'	48° 36'
EA	120° 09'	299° 39'

Determine the corrected bearings using the included angle method.

Question No. 2

2a) Determine the Reduced Levels of all the stations using Rise and Fall Method. Following are the staff readings. 1.05, 1.05, 1.25, 2.15, 2.4, 1.85, 3.3, 2.9, 2.8, 1.05, 3.5, 2.4. The instrument was shifted after 3rd, 6th and 10th reading. Consider RL of Bench mark as 255.4m.

(6) CO1,
CO2

Question No. 3

3a) Explain the repetition method of measuring horizontal angles with a theodolite. What sources of error are present?

(8) CO2,
CO3

OR

- 3b) Define the following: Face left, Swinging, Transiting, Departure, Traversing, Close traverse, Independent coordinate, Latitude. (8) CO2, CO3
- 3c) Given the lengths and bearings of the sides of a traverse ABCD as below, calculate the length and bearing of the line DA. (8) CO2, CO3

Side	Length (m)	Bearing
AB	65.5	126° 10'
BC	120.0	269° 15'
CD	40.0	315° 30'
DA	?	?

OR

- 3d) In a quadrilateral PQRS, the following latitudes and departures are noted. Find the area enclosed. (8) CO2, CO3

Side	Latitude (m)	Departure (m)
PQ	98.2	56.4
QR	-102.1	73.5
RS	-73.8	-52.6
SP	77.7	-77.3

Question No. 4

- 4a) Explain with sketch the fixed hair method of tacheometry when the line of sight is inclined downward and the staff is held vertically. (8) CO3, CO4

OR

- 4b) Define contour and explain the essential characteristics of contours with neat sketches. (8) CO3, CO4

- 4c) A tachometer was set up at a station P and following readings were obtained on a vertically held staff at Q. The constants of the instrument were 100 and 0. Find the distance MA and RLs of A. (8) CO3, CO4

Instrument station	Staff station	HI	Vertical angle	Hair readings	Remark
M	A	1.75	-10° 25'	1.125, 1.275, 1.425	RL of M = 200.00 m

OR

- 4d) A tachometer was set up at a station P and following readings were obtained on a vertically held staff. The constants of the instrument were 100 and 0. Find the distance PQ and RLs of Q. (8) CO3, CO4

Instrument station	Staff station	Vertical angle	Hair readings	Remark
P	BM	-6° 12'	0.963, 1.515, 2.067	RL of BM = 460.550m
	Q	7° 5'	0.819, 1.341, 1.863	

Question No. 5

- 5a) Two tangents intersect at point T at chainage 1060 m, with a deflection angle of 32°. Calculate all necessary data and initial tangent length for setting out a simple circular curve of radius 190 m using the method of ordinates from long chord. (8) CO2, CO5

OR

- 5b) Two tangents meet at a chainage of 1250 m, deflection angle 28°. Calculate the necessary data for setting out a simple circular curve of radius 175 m, using method of offsets from chord produced with a peg interval of 15 m. (8) CO2, CO5
- 5c) Write short notes on: (a) Transition curve (b) Point of intersection (c) point of tangency (d) Apex distance (8) CO2, CO5

OR

- 5d) Enumerate errors possible while setting out a curve and how they can be minimized. (8) CO2, CO5

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