K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:IV
Class:SY B Tech Civil Engineering	Program:B.Tech Civil Engineering
Branch Code:CIV	Pattern:2022
Name of Course:Surveying	Course Code: CIV222012
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 THREE 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 and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

a)	Define declination. The magnetic bearing of a line AB is S 300 15' W. Find the true bearing, if the declination is 100 15' E	(6)	CO1

Question No. 2 Attempt following Question

a)	In running fly levels from a bench mark of RL 139.00, the following readings were obtained: Backsight: 1.445, 2.595, 1.315, 2.825 Foresight: 0.475, 1.135, 0.495, 1.250 Calculate the Reduced levels of remaining points by rise and fall method. Apply usual arithmetic check.	(6)	CO2

Question No. 3 Attempt following Question

a)	Describe the process of measuring the horizontal angle?	(4)	CO3
	OR		
b)	Describe how would you measure vertical angle?	(4)	CO3
c)	Explain in brief how would you measure deflection angle?	(4)	CO3
	OR		
d)	Explain in brief how can a line be extended by a theodolite?	(4)	CO3

e) The following records are obtained in a traverse survey, where the length and bearing of the last line were not recorded: (8) CO3

Line	Length (m)	Bearing
PQ	75.50	300 24’
QR	180.50	1100 36’
RS	60.25	2100 30’
ST	?	?

Calculate the length and bearing of line ST

OR

f) The following observations were taken from stations P and Q: (8) CO3

Line	Length (m)	Bearing
PA	125.00	S 600 30’ W
PQ	200.00	N 300 30’ E
QB	150.50	N 500 15’ W

Calculate the length and bearing of AB, and also calculate the angles PAB and QBA.

Question No. 4 Attempt following Question

a) What is tacheometer? State the various characteristics of tacheometer (4) CO4

OR

b) What is tacheometry? Why is an anallatic lens provided in a tacheometer? (4) CO4

c) With the help of a neat sketch state any two characteristics of contour lines. (4) CO4

OR

d) With the help of a neat sketch state the difference between contour interval and horizontal equivalent. (4) CO4

e) A tacheometer was set up at a 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 + 80 24’ . Another observation on the vertically held staff of BM gave the following readings 1.640, 1.920, and 2.200, the inclination of the line of sight being - 10 6’. Calculate the horizontal distance between A and B and the elevation of B if the R.L. of BM is 418.685 meters, the constants of the instruments were 100 and 0.30 (8) CO4

OR

f) In a tacheometric surveying the following observations were taken from station P, upon a vertically held staff on stations Q and R. The tacheometer is provided with anallatic lens and multiplying constant is 100. (8) CO4

Inst. Stn.	Height of Inst.	Staff station	Bearing	Vertical angle	Staff readings
P	1.450 m	Q	PQ= 400 30’	+ 50 40’	1.255,1.860,2.465
P	1.450 m	R	PR= 1600 30’	- 30 20’	1.300,1.885,2.470

Calculate: (i) The distance QR (ii) The RL of points Q and R if the RL of P = 430.00 m

Question No. 5 Attempt following Question

a) What is the necessity of providing transition curves? What are their different forms. (4) CO5

OR

b) What are the different types of curves? Draw neat sketch of each. (4) CO5

c) What is the degree of the curve? What is the radius of 20 curves for 30 m chord ? (4) CO5

OR

d) What is apex distance? Express it mathematically. (4) CO5

e) Two straights intersect at a chainage of 1100 m, the deflection angle being 300. Calculate all the necessary data for setting out a circular curve of radius 200 m by the method of offsets from the chord produced, taking a peg interval of 30 m. (8) CO5

OR

f) Two tangents intersect at a chainage of 1100 m, the angle of intersection being1500. Calculate all the necessary data for setting out a circular curve of radius 200 m by the deflection angle method, taking a peg interval of 20 m. (8) CO5

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