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 FOUR 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 40^0 30' W. Find the true bearing, if the declination is 10^0 15' W   (6)   CO1

Question No. 2 Attempt following Question

a) The following readings were taken with Auto level and 4 m levelling staff on continuously sloping ground. The first reading was taken on B.M. of RL 400.00 m.   (6)   CO2

3.555, 2.225, 1.830, 0.675, 3.445, 2.885, 1.635, 1.115, 0.775, 3.775, 2.935.

Enter the readings in a tabular form and calculate the reduced levels and apply usual check. Use Collimation Plane Method

Question No. 3 Attempt following Question

a) Describe the process of measuring the horizontal angle?   (4)   CO3

OR

b) Describe how would you measure deflection angle?   (4)   CO3

c) The following table gives the corrected latitudes and departures (in meter) of the sides of a closed traverse ABCD: (4) CO3

Side	Latitude		Departure	
	N	S	E	W
AB	225.5	-	120.5	-
BC	-	245.0	210.0	-
CD	-	150.5	-	110.5
DA	170	-	-	220.0

Calculate the area of the traverse.

OR

d) With the help of a neat sketch explain in brief how can a line be extended by a theodolite? (4) CO3

e) A closed traverse was conducted round an obstacle and the following observations were made. Work out the missing quantities: (8) CO3

Side	Length (m)	Bearing
AB	500	98^0 30'
BC	620	30^0 20'
CD	468	298^0 30'
DE	-	230^0 00'
EA	-	150^0 10'

OR

f) Following records are obtained in a theodolite traverse survey where length and bearing of last side were not recorded. Calculate length and bearing of line DA. (8) CO3

Line	Length (m)	Bearing
AB	75.50	30^0 4'

BC	180.50	$110^0 36$'
CD	60.25	$210^0 30$'
DA	?	?

Question No. 4 Attempt following Question

a) State the various characteristics of tacheometer (4) CO4

OR

b) State any four characteristics of contour lines? (4) CO4

c) With the help of neat sketch explain in brief the field procedure of finding out tacheometric constant (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 $+ 8^0 24$' . 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 $- 1^0 6$'. 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) Find the constants of tacheometer when levelling staff is held vertical at distances of 100 m and 300 m from the axis of tacheometer and the staff intercept of horizontal sights are 00.990 m and 3.000 m respectively. The same instrument was set up at station A and staff is held vertical at Point B with the telescope inclined at an angle of depression of 10^0. The readings obtained on staff are 2.670, 1.835, 1.000 m. Calculate RL of B and its horizontal distance from A. Take Height of instrument = 1.42 m and RL of station A = 450.50 m (8) CO4

Question No. 5 Attempt following Question

a) Explain in brief the necessity of providing transition curves? What are their different forms (4) CO5

OR

b) Explain the various elements of simple circular curves (4) CO5

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

OR

d) Define the following terms : (4) CO5

i) Point of tangency, ii) Point of intersection, iii) Tangent Point, iv) Transition curve

e)   Two straights intersect at a chainage of 1100 m, the deflection angle being 30^0. Calculate all the   (8)   CO5
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.

OR

f)   Two straights of road deflect at an angle of intersection 120^0. They are to be connected by a circular   (8)   CO5
curve of 200 m radius.

Calculate i) length of tangent, ii) Apex distance, iii) length of long chord, iv) length of curve.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX