Reg. No.													

Question Paper Code	13925

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025
Third Semester
Civil Engineering
20CEPC302 - PLANE AND GEODETIC SURVEYING
Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)
Answer ALL Questions

		Marks	K – Level	CO
1.	The process of fixing or locating the position of stations on the ground is called	1	K1	CO1
	(a) Ranging (b) Chaining (c) Offsetting (d) Centering			
2.	The bearing measured clockwise from magnetic north is known as	1	K1	CO1
	(a) Whole circle bearing (b) Quadrantal bearing			
	(c) Reduced bearing (d) True bearing			
3.	Due to curvature of the Earth, the staff reading on a level line appears	1	K2	CO2
	(a) Greater than the true reading (b) Smaller than the true reading			
	(c)Unchanged (d) Depends on the instrument height			
4.	The process of keeping the table parallel to itself in successive positions is known as	1	K1	CO2
	(a) Centering (b) Leveling (c) Orientation (d) Setting			
5.	If the staff intercept (S) = 2.5 m, K = 100, and C = 0, the horizontal distance (D) is	1	K2	CO3
	(a) 2.5 m (b) 25 m (c) 250 m (d) 0.025 m			
6.	The spacing between contour lines depends on	1	K2	CO3
	(a) The horizontal scale only (b) The vertical interval only			
	(c) Both horizontal scale and vertical interval (d) The slope of the ground only			
7.	The process of connecting local surveys to national or global control systems is called	1	K2	CO4
	(a) Orientation (b) Adjustment (c) Densification (d) Geo-referencing			
8.	The method used to find the most probable value is	1	K2	CO4
	(a) Method of least squares (b) Arithmetic mean			
	(c) Method of moments (d) Weighted average			
9.	The minimum number of satellites required for 3D positioning (latitude, longitude, and elevation) is	1	K1	CO5
	(a) 2 (b) 3 (c) 4 (d) 5			
10.	The difference between true north and magnetic north is called	1	K1	CO6
	(a) Declination (b) Inclination (c) Deviation (d) Meridian angle			

PART - B (12 × 2 = 24 Marks)
Answer ALL Questions

		Marks	K – Level	CO
11.	What are the sources of errors in chain surveying?	2	K1	CO1
12.	Interpret the reduced bearing values for the whole circle bearings 150°and 270°.	2	K2	CO1
13.	What is the use of atrough compass in plane table surveying?	2	K2	CO2
14.	Define curvature and refraction in leveling.	2	K1	CO2
15.	Define an analytic lens.	2	K1	CO3
16.	What are the uses of Contours?	2	K1	CO3
17.	What are the sources of errors in surveying?	2	K1	CO4
18.	List the equipment used for base line measurement.	2	K1	CO4
19.	Outline the principles of EDM.	2	K2	CO5
20.	Show the steps involved in GPS data processing for establishment of control points.	2	K2	CO5
21.	Outline the corrections applied while calculating the true length.	2	K2	CO6
22.	Infer about Celestial Equator.	2	K2	CO6

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13925**

PART - C (6 × 11 = 66 Marks)
Answer ALL Questions

23. a) Summarize the suitable methods of chaining on sloping ground with neat sketches.   *11*   *K2*   *CO1*

OR

b) With the provided compass traverse survey data for stations PQRST.   *11*   *K2*   *CO1*
Interpret the interior angles and correct them for observational errors. Assuming the observed bearing of the line RS to be corrected adjust the bearing of the remaining sides.

Line	Fore Bearing	Back Bearing
PQ	80° 10'	259°0'
QR	120° 20'	301° 50'
RS	170° 50'	350° 50'
ST	230° 10'	49° 30'
TP	310° 20'	130° 15'

24. a) Develop on the suitability of different methods of plane table surveying for various   *11*   *K3*   *CO2*
field conditions.

OR

b) The following staff readings were observed successively with a level, the   *11*   *K3*   *CO2*
instrument having been moved after third, sixth and eighth readings 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 meters. Enter the above readings in a page of a level book and solve the R.L. of points if the first reading was taken with a staff held on a bench mark of 400.305 m.

25. a) Two observations were taken upon a vertical staff by means of a theodolite, the   *11*   *K3*   *CO3*
reduced level of its trunnion axis being 160.750. In the case of the first, the angle of elevation was 4°36' and the staff reading 0.75. In the case of second observation, the staff reading was 3.45 and the angle of elevation 5°48'. Solve the reduced level of the staff station.

OR

b) A tacheometer was setup at a station C and the following readings were obtained on   *11*   *K3*   *CO3*
a staff vertically held K = 100 and C = 0.15

Inst. Station	Staff station	Vertical angle	Hair Reading	Remarks
C	B.M.	-5˚20'	1.150, 1.800, 2.450	R.L.of B.M.
C	D	+8˚12'	0.750, 1.500 2.250	

Identify the horizontal distance CD and RL of D.

26. a) The Following observation were made from point P to Q   *11*   *K3*   *CO4*
Horizontal distance between P & Q   : 9290 m
Angle of elevation of Q at P   : 2⁰06'18"
Height of signal at Q   : 3.96 m
Height of instrument at P   : 1.25 m
Coefficient of refraction   : 0.07
Identify the R.L of Q, if R.L of P = 396.580m. Take R Sin1" = 30.88.

OR

	b)	Solve the most probable values of the following angles closing the horizon at a station by method of correlates	11	K3	CO4

P = 83º42'28.75"   weight 3
Q = 102º15'43.26"   weight 2
R = 94º38'27.22"   weight 4
S = 79º23'23.77"   weight 2

27.	a)	Explain the working principle of total station with merits and demerits.	11	K2	CO5

OR

	b)	Summarize in detail about Anti-spoofing and Selective Availability.	11	K2	CO5

28.	a)	Explain the different types of curves used in route surveying and describe how a simple curve is set out in the field with neat sketches.	11	K2	CO6

OR

	b)	Summarize the methods of hydrographic surveying and determination of mean sea level and azimuth.	11	K2	CO6