Reg. No.																

Question Paper Code	13123

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Third Semester

Civil Engineering

20CEPC302 - PLANE AND GEODETIC SURVEYING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	In a well-conditioned triangle, no angle should be less than (a) 30º (b) 60º (c) 90º (d) 120º	1	K1	CO1
2.	The surveying used to determine additional details such as boundaries of fields, is called (a) city surveying (b) location surveying (c) cadastral surveying (d) topographical surveying	1	K1	CO1
3.	The magnetic bearing of a line was observed 30° and the magnetic declination is 2° E. The true bearing of the line is (a) 30º (b) 32º (c) 31º (d) 28º	1	K2	CO1
4.	Permanent Bench Marks are established between G.T.S. Bench Marks by the _____ or other government agencies. (a) Survey of India (b) P.W.D. (c) Railways (d) Defense ministry	1	K1	CO2
5.	_____staff is provided with movable target. (a) Solid staff (b) Folding staff (c) Telescopic staff (d) Target staff	1	K1	CO2
6.	Elimination of parallax involves focusing the eye-piece for distinct vision of the _____. (a) Cross hairs (b) Image (c) Objective (d) Telescope	1	K1	CO2
7.	The _____ theodolite allows the telescope to revolve completely in a vertical plane. (a) Transit (b) Non-transit (c) Vernier (d) Optical	1	K1	CO3
8.	What indicates a steep slope on a contour map? (a) Widely spaced contours (b) Closely spaced contours (c) Concentric contours (d) Irregular contours	1	K1	CO3
9.	Two contour lines of different elevations can cross each other only in case of (a) A well (b) A cliff (c) A cave (d) A cliff or A cave	1	K1	CO3
10.	Determine the weight of the weighted arithmetic mean if the angles and their weights are given as 40º56'7" 9 40º56'2" 4 40º56'12" 5 (a) 13 (b) 18 (c) 81 (d) 10	1	K2	CO4
11.	In the principle of least squares, residual error will be_____ (a) Maximum (b) Minimum (c) Negligible (d) Nor error occurs	1	K1	CO4
12.	Independent co-ordinates can be calculated by using _____. (a) geometric co-ordinates (b) cylindrical co-ordinates (c) consecutive co-ordinates (d) spherical co-ordinates	1	K1	CO4
13.	What does SAASM stand for? (a) Secure Access Applied Safety Module (b) Selective Availability Anti-spoofing Module (c) Satellite Access Anti-spoof Mechanism (d) Signal Access Adaptive System Module	1	K2	CO5

14. _____ integrates the functions of Theodolite, EDM, and software, modernizing surveying practices. *1 K1 CO5*
(a) Barometer (b) Compass (c) Total station (d) Gyroscope

15. The GPS is used to map *1 K1 CO5*
(a) Cut blocks (b) Road alignments
(c) Environmental hazards (d) All of the above

16. What is the reason for sending two transmissions in the same band? *1 K1 CO5*
(a) Redundancy (b) Ionosphere refraction corrections
(c) Multiplexing (d) Reducing traffic

17. Soundings are conducted along a series of straight lines at right angles to the _____. *1 K1 CO6*
(a) Water current (b) Shoreline (c) Tidal flow (d) Riverbed

18. 1 solar tide = _____ lunar tide *1 K1 CO6*
(a) 0.56 (b) 0.458 (c) 0.327 (d) 0.256

19. The angle at P.C. between the back tangent and the chord from PC to that point is known as (P.C. = point of curve) *1 K1 CO6*
(a) Deflection angle (b) Rankine angle
(c) Back tangent angle (d) Forward tangent angle

20. The angular distance of a heavenly body from the equator, measured along its meridian, is called *1 K2 CO6*
(a) Declination (b) Altitude (c) Zenith distance (d) Co-latitude

PART - B (10 × 2 = 20 Marks)
Answer ALL Questions

21. Differentiate plane surveying and geodetic surveying. *2 K2 CO1*
22. Convert the following WCB into QB, i. 270º, ii. 130º40'. *2 K2 CO1*
23. What is meant by benchmark? What are different types of benchmarks? *2 K1 CO2*
24. List out the merits of plane table surveying. *2 K1 CO2*
25. State the reason for taking face left & face right observations. *2 K2 CO3*
26. Define contour interval. *2 K1 CO3*
27. What do you mean by reduction to centre? *2 K1 CO4*
28. Distinguish between the observed value and the most probable value of a quantity. *2 K2 CO4*
29. What is the need for anti-spoofing in GPS? *2 K1 CO5*
30. Differentiate "Tropic of Cancer" from "Tropic of Capricorn". *2 K2 CO6*

PART - C (6 × 10 = 60 Marks)
Answer ALL Questions

31. a) Explain in detail about instrument & accessories used for Chaining and Ranging. *10 K2 CO1*

OR

b) The following bearings were observed with a compass. *10 K2 CO1*

Line	F.B	B.B
AB	80º40'	260º 40'
BC	121º 55'	301º 55'
CD	170º 50'	350º 50'
DE	230º 5'	50º 5'
EA	310º 50'	130º 50'

Determine the interior angles & apply the arithmetic check.

32. a) The following staff readings were observed successively with level, the instrument having been moved forward after the second, fourth and eighth readings 0.675, 1.230, 0.750, 2.565, 2.225, 1.935, 1.835, 3.220, 3.115 and 2.875. The first reading was taken with the staff held upon a benchmark of elevation 100.000. Enter the readings in level book form and find reduce the level of all points by any one methods. *10 K3 CO2*

OR

b) Explain any three methods of plane table surveying with neat sketch. *10 K2 CO2*

33. a) Explain in detail about the methods of locating contours with neat sketches. *10 K2 CO3*

OR

b) A tacheometer was setup at station C and the following reading were obtained on a staff held vertically. K = 100 and C = 0.15 *10 K3 CO3*

Inst. Station	Staff Station	Vertical Angle	Staff Reading
C	BM	-5º20’	1.150, 1.800, 2.450
C	D	+8º12’	0.750, 1.500, 2.250

RL of BM 750.500 m. Calculate the horizontal distance CD and RL of D.

34. a) The following are mean values observed in the measurement of three angles α, β and γ at one station. *10 K3 CO4*

α	= 76º42’46.2”	weight 4
α + β	= 134º36’32.6”	weight 3
β + γ	= 185º35’24.8”	weight 2
α + β+ γ	= 262º18’10.4”	weight 1

OR

b) The Following observation were made from point P to Q *10 K3 CO4*

Horizontal distance between P & Q	: 9290 m
Angle of elevation of Q at P	: 2º06’18”
Height of signal at Q	: 3.96 m
Height of instrument at P	: 1.25 m
Coefficient of refraction	: 0.07

Find the R.L of Q, if R.L of P = 396.580m. Take R Sin1” = 30.88

35. a) Draw a neat sketch and explain the working principle of Microwave total station equipment. *10 K2 CO5*

OR

b) Explain in detail about the different segments of GPS. *10 K2 CO5*

36. a) Explain in detail about the Route survey for Highways, railways and waterways. *10 K2 CO6*

OR

b) Explain the different coordinate systems by which the position of heavenly body can be specified. *10 K2 CO6*