CBCS SCHEME

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21CV32

Third Semester B.E. Degree Examination, Jan./Feb. 2023
Geodetic Engineering

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Define Surveying. Explain the basic principles of surveying with neat sketches. **(06 Marks)**

b. Differentiate between Plane and Geodetic Surveying. **(06 Marks)**

c. Calculate the interior angles of the following traverse ABCDEA. Apply check and plot the traverse (not to scale).

Line	AB	BC	CD	DE	EA
FB	60° 30'	122° 0'	46 ° 0'	205° 30'	300° 0'

(08 Marks)

OR

2 a. Distinguish between :
i) True meridian and Magnetic meridian.
ii) Whole circle bearing and Quadrantal bearing system. **(06 Marks)**

b. Explain Radiation and Traversing methods of plane table surveying with sketches. **(09 Marks)**

c. What are the advantages and disadvantages of Plane table surveying? **(05 Marks)**

Module-2

3 a. What are the general methods of determining the area? **(05 Marks)**

b. Write short notes on Digital Planimeter. **(05 Marks)**

c. The following staff readings were taken with a level , the instrument having been moved after third, sixth and eighth readings.
2.225 , 1.625, 0.985, 2.095, 2.795, 1.265, 0.605, 1.980, 1.045 and 2.685m.
Enter the above readings in a page of level book and calculate the RL of points. The first reading was taken on a benchmark of RL 100.00m. Use H.I method. **(10 Marks)**

OR

4 a. Define the following terms :
i) Bench mark ii) MSL iii) Turning point iv) Fore sight v) Reduced level. **(05 Marks)**

b. Explain Fly Leveling, with neat sketch. **(05 Marks)**

c. The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundary line. 3.25 , 5.60 , 4.20 , 6.65 , 8.75 , 6.20 , 3.25 , 4.20 , 5.65m.
Calculate the area enclosed between the survey line , the irregular boundary line and the first and last offset by the application of i) Average ordinate rule ii) Trapezoidal rule iii) Simpson's rule. **(10 Marks)**

Module-3

5 a. Define the following : i) Face left ii) Transiting iii) Swinging iv) Trunnionaxis. **(04 Marks)**

b. Explain the Measurement of Horizontal angle by Repetition method. Draw typical tabular column. List the errors eliminated by this method. **(08 Marks)**

c. To determine the elevation of top of aerial pole the following observations are made :

Instrument station	Reading on B.M	Angle of Elevation to aerial pole	Remarks
A	1.377	11° 53'	R.L of BM = 30.15m
B	1.263	8° 5'	

Stations "A" and "B" and the top of aerial pole are in the same vertical plane. Find the elevation of top of aerial pole. If the distance between A & B is 30m. **(08 Marks)**

OR

6 a. List the fundamental lines of a theodolite and state derived relationships. **(05 Marks)**

b. With the help of neat sketch, explain Double plane method for determining horizontal and vertical distance and elevation of an elevated object. **(07 Marks)**

c. The following observations were made using a tacheometer fitted with an anallactic lens having the constant to be 100 and the staff held vertical.

Instrumentation	H.I	Staff station	WCB	Vertical angle	Staff readings
0	151.55m	A	30° 30'	4° 30'	1.155, 1.755, 2.355
		B	75° 30'	10° 15'	1.250, 2.000, 2.750

Calculate i) The horizontal distance AB ii) RL of "A" & "B"
iii) Gradient from A to B. **(08 Marks)**

Module-4

7 a. Define the following with a neat sketch of simple circular curve :
i) Tangent length ii) Length of long chord iii) Intersection angle
iv) Point of curve v) Summit distance vi) Vertex distance. **(06 Marks)**

b. Calculate the perpendicular offset from long chord at 20m interval to setout a simple curve of 280m radius and deflection angle 60°. **(06 Marks)**

c. Two tangents intersect at a chainage of 1000m, the deflection angle being 28°. Calculate the necessary data to set out a simple curve of radius 250m by Rankine's deflection angle method and tabulate the results. Take peg interval as 20m. **(08 Marks)**

OR

8 a. List the functions and essential requirement of an ideal transition curve. **(06 Marks)**

b. Two straight BA & AC are intersected by a line EF. The angle BEF and EFC are 130° and 140°. The radius of first arc is 500m and the second arc is 300m. Find the Chainages of tangent points and point of compound curvature given that the chainage of the intersection point A is 3200m. **(08 Marks)**

c. Two parallel railway lines are to be connected by a reverse curve, each section having the same radius. If the lines are 12m apart and the maximum distance between tangent points measured parallel to the straights is 48m, find the maximum allowable radius. Calculate the chainage of point of reverse curvature and point of tangency, if the chainage of $T_1 = 912m$ (CH_{pc}). **(06 Marks)**

Module-5

9 Write short notes on the following :
a. Basic principles of Photogrammetry b. LIDAR Technology
c. EMR d. Principles of Remote sensing. **(20 Marks)**

OR

10 a. What is GPS? Explain the applications of GPS in surveying. **(06 Marks)**

b. What is GIS? With a neat sketch, explain the components of GIS. **(06 Marks)**

c. Explain the following : i) Drones ii) Electronic theodolite. **(08 Marks)**

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