

CBCS SCHEME

21CV32



Third Semester B.E. Degree Examination, Dec.2023/Jan.2024 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. Explain the basic principles of surveying with sketches. (06 Marks)
- b. Define the following:
- True meridian
 - Magnetic meridian
 - Arbitrary meridian
 - Magnetic declination
 - Local attraction
 - Angle of dip. (06 Marks)
- c. The following interior angles were measured with a sextant in a closed traverse. The bearing of the line AB was measured as $60^{\circ}00'$ with prismatic compass. Calculate the bearings of all other line if $\angle A = 140^{\circ}10'$, $\angle B = 99^{\circ}8'$, $\angle C = 60^{\circ}22'$, $\angle D = 69^{\circ}20'$. (08 Marks)

OR

- 2 a. Differentiate between prismatic compass and surveyors compass. (06 Marks)
- b. The following bearings were observed in running a close traverse:

Line	F.B	B.B
AB	$75^{\circ}5'$	$254^{\circ}20'$
BC	$115^{\circ}20'$	$296^{\circ}35'$
CD	$165^{\circ}35'$	$345^{\circ}35'$
DE	$224^{\circ}50'$	$44^{\circ}5'$
EA	$304^{\circ}50'$	$125^{\circ}5'$

- At what station do you suspect the local attraction? Determine the correct magnetic bearing's. If declination was $5^{\circ}10'$ E, what are true bearings? (08 Marks)
- c. Explain radiation method of plane table surveying's with a neat sketch. (06 Marks)

Module-2

- 3 a. Illustrate with neat sketches:
- Profile levelling
 - Differential levelling
 - Fly levelling
 - Reciprocal levelling. (08 Marks)
- b. What are the methods of levelling? Explain briefly. (06 Marks)

- c. The following figures were extracted from a level field book, some of the entries being illegible owing to exposure to rain. Insert the missing figures and check the results. Rebook all the figures by the rise and fall method.

Station	B.S	I.S	F.S	Rise	Fall	R.L	Remarks
1	2.285					232.460	B. M1
2	1.650		X	0.020			
3		2.105			X		
4	X		1.960	X			
5	2.050		1.925		0.300		
6		X		X		232.255	B. M2
7	1.690		X	0.340			
8	2.865		2.100		X		
9			X	X		233.425	B. M3

(06 Marks)

OR

- 4 a. Discuss the methods areas from offsets at regular intervals. (10 Marks)
 b. A railway embankment is 10m wide with side slope $1\frac{1}{2}$ to 1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 120m, the centre heights at 20m intervals being in meters 2.2, 3.7, 3.8, 4.0, 3.5, 2.8, 2.5.

(10 Marks)

Module-3

- 5 a. With a neat sketch explain the component parts of theodolite. (10 Marks)
 b. Explain the temporary adjustments of transit theodolite. (10 Marks)

OR

- 6 a. Derive the expression for the horizontal distance, vertical distance and the elevation of an elevated object by double plane method. (10 Marks)
 b. The elevation of a point P is to be determined by observations from two adjacent stations of a tacheometric survey. The staff was held vertically upon the point and the instrument is fitted within an anallactic lens, the constant of the instrument being 100. Compute the elevation of the point P from the following data, taking both the observations as equally trustworthy.

Station	Weight of axis	Staff point	Vertical angle	Staff readings	Elevation of station
A	1.42	P	+2° 24'	1.230, 2.055, 2.880	77.750m
B	1.40	P	-3° 36'	0.785, 1.800, 2.815	97.135m

(10 Marks)

Module-4

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- 7 a. With the help of a neat sketch of a simple curve. Explain.
 i) Forward tangent
 ii) Point of intersection
 iii) Point of curve
 iv) Point of tangency
 v) Intersection angle
 vi) Tangent distance
 vii) Length of curve
 viii) Long chord.

(10 Marks)

- b. Two tangents intersect at a chainage 1250m the angle of intersection is $150'$. Calculate all the data necessary for setting out a curve of radius 250m by the deflection angle method. The peg interval may be taken as 20m. Prepare a setting out table when the least count of the vernier is $20''$. Calculate the data for field checking. (10 Marks)

OR

- 8 a. A compound curve is to connect two straights having a deflection angle of 90° . The lengths of the two transcripts are 350m and 400m respectively. Calculate the lengths of the two area if the radius of the first curve is be 300m. (10 Marks)
- b. A transition curve is required for a circular curve of 200m radius, the gauge being 1.5m and maximum super-elevation restricted to 15cm. The transition is to be designed for a velocity such that no lateral pressure is imposed on the rails and the rate of gain of radial acceleration is $30\text{cm}/\text{sec}^3$. Calculate the required length of the transition curve and the design speed. (10 Marks)

Module-5

- 9 a. With a sketch write a note on relief displacement in vertical photograph and derive formula for relief displacement. (10 Marks)
- b. Define remote sensing. Explain the stages of idealized remote sensing system. (10 Marks)

OR

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- 10 a. Define GIS. Give the components of GIS. Write a note on integration of remote sensing with GIS. (10 Marks)
- b. Mention the advantages of total station. Discuss on the functions of the same. (10 Marks)

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