

Third Semester B.E. Degree Examination, Dec.2024/Jan.2025
Basic Surveying

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define and explain plane and Geodetic surveying. (08 Marks)
 b. Name and Explain important sources of Errors in surveying. (06 Marks)
 c. Explain the terms Plans and Maps. Mention their application.. (06 Marks)

OR

- 2 a. A field tape, standardized at 20°C measured 100.0056m. Determine the temperature at which it will be exactly of the nominal length of 100m. Take $\alpha = 11.2 \times 10^{-6}$ per °C. (06 Marks)
 b. Name and explain the various instruments for chaining in surveying. (14 Marks)

Module-2

- 3 a. Distinguish between :
 i) Magnetic meridian and True Meridian ii) WCB and QB. (06 Marks)
 iii) Isogonic line and Agonic line. (06 Marks)
 b. Differentiate between prismatic compass and surveyor's compass. (06 Marks)
 c. Following bearing were observed with a compass. Calculate the interior angles. (08 Marks)

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

OR

- 4 a. Define : i) True meridian and time bearing ii) Isogonic line and Agonic line. (06 Marks)
 iii) Fore bearing and Back bearing.
 b. The following are the bearings of a closed traverse ABCDEA. At what stations , do you suspect the local attraction? Find the corrected bearings of the lines. (07 Marks)

Line	FB	BB
AB	124°30'	304°30'
BC	68°15'	246°0'
CD	310°30'	135°15'
DA	200°15'	17°45'

- c. In the following traverse ABCDE, the length and bearing of line EA is omitted, calculate the length and bearing of line EA. (07 Marks)

Line	Length (m)	Fore Bearing (FB)
AB	204.0	87°30'
BC	226.0	20°20'
CD	187.0	280°0'
DE	192.0	210°03'
EA	?	?

Module-3

- 5 a. Describe with sketches the collimation method of reducing levels and compare the collimation method with the rise and fall method. (10 Marks)
- b. The following consecutive readings were taken with a level and 4.0m staff on a continuously sloping ground at a common interval of 30m:
0.780, 1.535, 1.955, 2.430, 2.985, 3.480, 1.155, 1.960, 2.365, 3.640, 0.935, 1.045, 1.630 and 2.545.
The reduced level of the first point A = 180.750m. Calculate the reduced levels of the points by the collimation method and get the gradient of the joining first and last point? (10 Marks)

OR

- 6 a. Discuss on the curvature and refraction effect in levelling? (10 Marks)
- b. The following notes refers to the reciprocal levels taken with one level :

Instrumentation station	Staff readings on		Remarks
	A	B	
A	1.030	1.630	Distance AB = 800m
B	0.950	1.540	RL of A = 450m

Find the true difference of elevation between A and B. Also find the collimation error of instrument. (10 Marks)

Module-4

- 7 a. Explain the working operations of plane table. (06 Marks)
- b. Explain Radiation and Traversing methods of plane table surveying with sketches. (08 Marks)
- c. Describe with sketches two-point problem in plane table surveying. (06 Marks)

OR

- 8 a. Explain briefly Intersection and Resection Methods of plane table surveying with sketches. (10 Marks)
- b. Describe the different Errors in plane table surveying. (10 Marks)

Module-5

- 9 a. Define a contour. Explain the characteristics of contour. (08 Marks)
- b. The following perpendicular offsets were taken at 10 mt 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, 5.65
Calculate the area enclosed between the survey line, the irregular boundary line and the first and last offset by the applications of i) Average ordinate rule ii) Trapezoidal rule.
iii) Simpson's rule. (12 Marks)

OR

- 10 a. Discuss the methods of determining volumes. (06 Marks)
- b. List the uses of contours. (04 Marks)
- c. A Railway embankment is 10 mt wide with side slopes $1\frac{1}{2}:1$. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 120 mt, the centre heights at 20 mt intervals being in meters.
2.2, 3.7, 3.8, 4.0, 3.8, 2.8, 2.5
Use Trapezoidal and Prismoidal rules. (10 Marks)

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