

# CBCS SCHEME

17CV34



## Third Semester B.E. Degree Examination, July/August 2022 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. What is Surveying? Explain the basic principles of Surveying. (06 Marks)
- b. Give the broad classification of surveying. (08 Marks)
- c. Differentiate between Plan and Map. (06 Marks)

**OR**

- 2 a. What do you understand by Ranging a line? Explain how you range a line between two points which are not visible to each other due to small hillock in between. (08 Marks)
- b. What are the Sources of error? (04 Marks)
- c. A tape 20m long of standard length at 84°F was used to measure a line, the mean temperature during measurement being 65°F. The measured distance was 882.10m, the following being the slopes.  
2° 10' for 100m    7° 48' for 200m  
4° 12' for 150m    3° 0' for 300m  
1° 6' for 50m    5° 10' for 82.1m.  
Find the true length of the line if the coefficient of expansion of tape is  $65 \times 10^{-7}/1^\circ\text{F}$ . (08 Marks)

### Module-2

- 3 a. Differentiate between : i) True Meridian and Magnetic meridian  
ii) Dip and Declination    iii) Fore bearing and Back bearing. (06 Marks)
- b. A line AB was drawn to bore a magnetic bearing of 35° 15' in an old map when the declination was 3° 15' E. Determine the magnetic bearing of the line, if the present declination is 7° 30' W. (04 Marks)
- c. The following bearings were taken in running a closed compass traverse while surveying.

Line	AB	BC	CD	DA
FB	S 45° 30' E	S 60° E	S 5° 30' E	N 83° 30' W
BB	N 45° 30' W	N 60° 40' W	N 30° 20' W	S 85° 0' E

State the stations which are affected by local attraction and determine the correct bearings. Calculate the true bearings, if the declination was 1° 30' E. (10 Marks)

**OR**

- 4 a. Define the terms : i) The vertical axis    ii) The axis of bubble tube  
iii) Line of Collimation    iv) Swing of telescope. (04 Marks)
- b. Explain the Spire test for the permanent adjustment of transit theodolite. (08 Marks)
- c. Explain the repetition method of measuring the horizontal angle using transit theodolite. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**Module-3**

- 5 a. What is meant by balancing of Traverse? Explain the Transit rule method of adjusting the traverse. (10 Marks)
- b. The following data is available for closed traverse ABCDEA. Check for angular error and correct if necessary. Determine closing error and adjust the traverse using Bowditch method. Take coordinates of station A as (400, 400), compute coordinates of all stations. (10 Marks)

Line	AB	BC	CD	DE	EA
FB	92°	174°	220°	279°	48°
BB	272°	354°	40°	99°	228°
Length (m)	130	158	145	308	337

**OR**

- 6 a. The following are the observations taken from a tachometric station. Find the gradient of line AB. Tachometric constant 100 & 0.3.

Inst. Station	Staff Station	Bearing	Vertical angle	Staff intercept	Axial Hair Reading
P	A	40° 35'	-4° 24'	2.175m	1.965m
P	B	117° 05'	-5° 12'	1.985m	1.865m

- b. Derive the distance of Elevation formula for stadia tachometry, when the staff is held vertical and the line of sight being inclined. (10 Marks)

**Module-4**

- 7 a. Define the terms : i) Level surface ii) Horizontal plane iii) Datum. (06 Marks)
- b. Write a note on Auto level. (04 Marks)
- c. The following records refers to an operation involving reciprocal leveling :

Instrument at	Staff Reading on		Remarks
	A	B	
A	1.155	2.595	Distance AB = 500m
B	0.985	2.415	RL of A = 525.500m

- i) Find the true RL of B.
- ii) Find the combined correction for curvature and refraction.
- iii) Collimation error.
- iv) Whether the line of collimation is inclined upwards or downwards. (10 Marks)

CMRIT LIBRARY  
BANGALORE - 560 037

**OR**

- 8 a. The following consecutive readings were taken with a level and a 4.0m leveling staff on a continuously sloping ground at a common interval of 30m.  
2.545m , 1.630 , 1.045 , 0.935 , 3.640 , 2.365 , 1.960 , 1.155 , 3.480 , 2.985 , 2.430 , 1.955 , 1.535 and 0.780 (m).  
The reduced level of the first point A was 180.750m. Rule out a page of level field book and enter the above readings. Calculate the RL of all points by Rise and Fall method. Also calculate the gradient of the line joining first and last points. (10 Marks)
- b. Derive the expression for the horizontal distance, vertical distance and the elevation of an elevated object, when the base is inaccessible and instrument stations are in the same vertical plane with the object. (10 Marks)

**Module-5**

- 9 a. Describe the characteristics of Contours. (08 Marks)  
 b. The following offsets were taken from a chain line to an irregular boundary line at an interval of 10m. Compute the area by i) Average ordinate rule ii) Trapezoidal rule iii) Simpson's 1/3<sup>rd</sup> rule.  
 3.25 , 5.60 , 4.20 , 6.65 , 8.75 , 6.20 , 3.25 , 4.20 and 5.65m. (12 Marks)

OR

CMRIT LIBRARY  
BANGALORE - 560 037

- 10 a. Explain the uses of Contour Map. (04 Marks)  
 b. Discuss about Contour Gradient. (04 Marks)  
 c. The area enclosed by various contours are given below :

Contour (m)	100	105	110	115	120	125
Area (ha)	3	8	10	15	20	25

Determine the capacity of the reservoir, if the full reservoir level is 125.0m by both the Prismoidal and Trapezoidal rule. Ignore the volume below RL 100.000m. (12 Marks)

\*\*\*\*\*