CBCS SCHEME

USN | | | | | | | | | | |

18CV35

Third Semester B.E. Degree Examination, June/July 2024
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 Surveying and mention its main objective. **(05 Marks)**

b. Classify surveying according to instruments used. **(05 Marks)**

c. The area of the plan of an old survey plotted to a scale of 10 metres to 1 cm measures now as 100.2 cm^2 as found by a planimeter. The plan is found to have shrunk so that a line originally 10 cm long now measures 9.7cm only. There was also a note on the plan that the 20 m chain used was 8 cm too short. Find the true area of Survey. **(10 Marks)**

OR

2 a. Define Ranging and explain the methods of ranging. **(05 Marks)**

b. Explain the process of measuring the distance directly along a sloping ground to compute the horizontal distance between two points. **(05 Marks)**

c. A steel tape 20m long standardized at 55°F with a pull of 10kg was used for measuring a base line. Find the correction per tape length, if the temperature at the time of measurement was 80°F and the pull exerted was 16kg. Weight of one cubic cm of steel : 7.86 g ; weight of tape : 0.8 kg ; E = 2.109×10^6 kg/cm^2. Coefficient of expansion of tape per °F = 6.2×10^{-6}. **(10 Marks)**

Module-2

3 a. Define (i) Whole Circle bearing (ii) Reduced Bearing. **(05 Marks)**

b. Explain (i) Fore bearing (ii) Back Bearing of a line. **(05 Marks)**

c. The following bearings were observed with a compass. Determine the Interior angles.

LINE	F.B.
AB	60° 30′
BC	122° 00′
CD	46° 00′
DE	205° 30′
EA	300° 00′

(10 Marks)

OR

4 a. Define dependent and independent coordinates as applied to traverse survey. **(05 Marks)**

b. Explain with sketches latitude and departure of a survey line. **(05 Marks)**

c. Calculate latitudes, departures and closing error for the following traverse and adjust the traverse by Bowditch's rule:

LINE	LENGTH (m)	W.C.B.
AB	89.31	45° 10′
BC	219.76	72° 05′
CD	151.18	161° 52′
DE	159.10	228° 43′
EA	232.26	300° 00′

(10 Marks)

Module-3

5 a. Define (i) Back sight (ii) Foresight (iii) Intermediate sight (iv) Change point (v) Station **(05 Marks)**

b. Explain temporary adjustments of Dumpy level. **(05 Marks)**

c. The following consecutive readings were taken with a level using a 4m levelling 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 first station A was 180.750. Rule out a page of level field book and enter the above readings. Calculate the reduced levels of all stations by Height of Instrument method. Apply usual check. Also calculate the gradient of the line joining First and Last station. **(10 Marks)**

OR

6 a. Define (i) Check levelling (ii) Reciprocal levelling. **(05 Marks)**

b. Compare Height of Instrument method and rise and fall methods of reduction of levels. **(05 Marks)**

c. Fill up the missing readings and apply check for a level book page.

Stn	BS	IS	FS	Rise	Fall	R.L.	Remarks
1	3.125					?	BM
2	?		?	1.325		125.505	T.P
3		2.320			0.055	?	
4		?		?		125.850	
5	?		2.655		?	?	T.P
6	1.620		3.205		2.165	?	T.P
7		3.625			?	?	
8			?			123.090	T.B.M

(10 Marks)

Module-4

7 a. List any four advantages and disadvantages of plane table survey. **(05 Marks)**

b. Explain with sketches the use of (i) Alidade (ii) Plumbing fork, in plane table survey. **(05 Marks)**

c. Explain with sketches radiation method of plane tabling. **(10 Marks)**

OR

8 a. Define back orientation in plane table survey and mention the methods of back orientation. **(05 Marks)**

b. Explain the operations (i) Centering (ii) Levelling (iii) Orientation as applied to plane table survey. **(05 Marks)**

c. Explain intersection method of plane tabling with sketch. **(10 Marks)**

Module-5

9 a. Define (i) Trapezoidal rule (ii) Simpson's one third rule. **(05 Marks)**

b. Explain any five characteristics of contours. **(05 Marks)**

c. A railway embankment is 10m wide with side slopes 1½ : 1. Assuming the ground to be level in a direction transverse to the central line, calculate the volume contained in a length of 120 metres, the central heights at 20m intervals being in metres are :

2.2, 3.7, 3.8, 4.0, 3.8, 2.8, 2.5.

Use (i) Trapezoidal (ii) Simpson's rule. **(10 Marks)**

OR

10 a. Define (i) Contour interval (ii) Horizontal Equivalent **(05 Marks)**

b. List any five user of contour maps. **(05 Marks)**

c. The following table gives the corrected latitudes and departures (in metres) of the side of a closed traverse ABCD.

Side	LATITUDE		DEPARTURE	
	N	S	E	W
AB	108		4	
BC	15		249	
CD		123	4	
DA	0			257

Assuming the coordinates of A as (100, 100), calculate the area by using coordinate method. **(10 Marks)**

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