Total number of printed pages: 3

Programme (UG)/3rd Sem/UCE301

2023

SURVEYING - I

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. (a) What are the different methods used in plane table surveying? Explain in detail any two methods with a neat diagram? (2+8)

1. (b) Explain the factors on which the choice of proper contour interval depends? (5)

1. (c) A 30 m chain was found to be 10 cm too long after chaining a distance of 1300 m. It was found to be 17 cm too long after chaining a total distance of 2800 m. Find the true distance if the chain was correct before the commencement of the work. (5)

2. (a) The following consecutive readings were taken with a level: 1.687, 1.564, 1.850, 2.982, 0.421, 0.987, 1.667, 2.354, 1.782, 2.545. The first reading was taken on a B.M. of R.L. 100 *m*. The instrument was moved after third, sixth and eight readings. Enter the above readings in a level field-book form and reduce the levels. Apply the check. (10)

2. (b) Explain in detail any two uses of contour map? (3+3)

2. (c) What are the advantages and disadvantages of plane table surveying? (4)

3. (a) A reciprocal levelling was carried out between two points A and B on opposite banks of a river, the level was set up near A, and the staff readings on A and B were 2.224 *m* and 3.166 *m* respectively. The level was then moved near B and the respective readings on A and B were 1.342 *m* and 2.431 *m*. Find the true difference in elevation between A and B. (5)

3. (b) Write down the procedure to determine a vertical angle using a transit theodolite? (5)

3. (c) What is temporary adjustments? What are the steps involved in temporary adjustment of a transit theodolite? (5)

3. (d) Define the following with respect to a theodolite: (5)

   (i) Transiting

   (ii) Face left observation

   (iii) Levelling

(iv) Trunnion axis

(v) Line of sight

4. (a) Write down the procedure for Reiteration method to determine the horizontal angles using a transit theodolite? (5)

4. (b) The following observations were made to determine the top of the flag-staff: (5)

Instrument station	Reading on B.M. (m)	Angle of Elevation	Remarks
P	2.156	8°48′	R.L. of B.M. = 52.355 m
R	1.654	6°20′	

Stations A and B and the top of the flag-staff are in the same vertical plane. Find the elevation of the top of the flag-staff, if the distance between A and B was 80 *m*.

4. (c) Define: (3+7)

(i) Contour

(ii) Contour gradient

(iii) Contour interval

Write any seven characteristics of contour map?

5. (a) The following bearings were observed with a prismatic compass: (10)

Line	F.B.	B.B.
AB	71°20′	107°20′
BC	98°40′	81°0′
CD	186°20′	6°20′
DE	267°30′	86°10′
EA	343°40′	167°40′

Calculate the included angles and check for any observational errors. Consider the bearings of line CD to be correct and compute the corrected bearings for all other lines.

5. (b) Differentiate between: (5x2)

(i) Fore bearing and back bearing

(ii) Prismatic compass and Surveyor's compass

(iii) True meridian and magnetic meridian

(iv) Plane surveying and geodetic surveying

(v) Cumulative error and compensating error

6. (a) Explain: (5x2)

(i) Cadastral survey

(ii) Accidental error

(iii) Local attraction

(iv) Principles of surveying

(v) Reciprocal ranging

6. (b) The following reciprocal levels were taken: (5)

Instrument near	Staff readings on (m)		Remarks
	A	B	
A	1.876	2.412	Distance AB = 985 m
B	0.962	1.323	R.L. of A = 56.234 m

Find:

(i) The true R.L. of B.

(ii) Combined correction for curvature and refraction.

6. (c) What is : (5)

(i) Orientation

(ii) Resection

(iii) Alidade

(iv) Fiducial edge

(v) Centring

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