Total number of printed pages: 3 **Programme (UG)/3rd Sem/UCE301**

2022

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 do you mean by orientation in plane table survey? Explain the two different methods to perform orientation of plane table. (2+6 = 8)

   b) Differentiate between prismatic compass and surveyor's compass. (6)

   c) What is reciprocal ranging? Explain its procedure. (6)

2. a) Derive the equations for corrections due to effect of curvature and refraction and write the equation for combined corrections. (6)

   b) The following bearings were observed with a prismatic compass: (6)

Line	F.B.	B.B.
AB	71°0′	264°0′
BC	98°0′	263°0′
CD	168°0′	345°0′
DE	176°0′	6°0′
EA	187°0′	7°0′

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

   c) What are the advantages and disadvantages of plane table survey? (4)

   d) What is contour gradient? What are the uses of contour maps? (4)

3. a) Draw a neat diagram and explain the intersection method of plane table survey. (5)

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
A	2.145	7°40′	R.L. of B.M.
B	1.320	6°32′	= 52.342 *m*

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 60 *m.*

c) What are the factors on which the choice of proper contour interval depends? (5)

d) Define resection in plane table survey. Explain the steps followed in temporary adjustments of plane table survey. (1+4=5)

4. a) Explain repetition method in theodolite survey and also prepare the observation table. (5)

b) Draw a neat diagram and explain the radiation method of plane table surveying. (4)

c) In levelling 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 2.145 *m* and 3.250 *m* respectively. The level was then moved near B and the respective readings on A and B were 1.865 *m* and 2.675 *m.* Find the true difference in elevation between A and B. (5)

d) Define: (2x3=6)

(i) Geodetic survey
(ii) Cadastral survey
(iii) Topographical survey

5. a) Define: (10x2=20)

(i) Benchmark
(ii) Bearing
(iii) Meridian
(iv) Height of instrument
(v) Differential levelling
(vi) Profile levelling
(vii) M.S.L
(viii) R.L.
(ix) Datum
(x) Contour interval

6. a) The following reciprocal levels were taken: (6)

Instrument Near	Staff Readings on A	Staff Readings on B	Remarks
A	1.445	2.338	Distance AB = 1010 *m*
B	0.870	1.615	R.L. of A = 142.450

Find: (i) the true R.L. of B.

(ii) Combined correction for curvature and refraction.

b) Convert the following bearings from one system to another: (4)

i) AB 79°20′

ii) BC 159°40′

iii) CD N58°35′W

iv) DE S65°25′E

c) The following consecutive readings were taken with a level and 3 *m* levelling staff: (10)

0.565, 1.245, 1.760, 2.874, 0.546, 0.825, 1.765, 2.891, 1.840, 2.488.

The R.L. of the first point (B.M.) was 50 *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.

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