

Roll No.

Total No. of Pages : 02

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B.Tech. (Agriculture Engg.) (Sem.-4)

SURVEYING AND LEVELLING

Subject Code : BTAG-401-19

M.Code : 80014

Date of Examination : 02-07-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) Define surveying.
- b) How are scales classified?
- c) What are proof lines?
- d) Define the terms back bearing and magnetic declination.
- e) What are permanent adjustments?
- f) What is dip?
- g) List the instruments used in plane table survey.
- h) What is two point problem?
- i) What is face left and face right observation?
- j) Name various types of levelling.

SECTION-B

2. Discuss classification of surveying based on :
 - a) nature of field survey
 - b) object of survey.

3. What factors should be considered in deciding the stations of a chain survey?
4. A four sided traverse ABCD, has the following lengths and bearings:

| Side | Length (m) | Bearing (degrees) |
|------|---------------|-------------------|
| AB | 500 | Roughly East |
| BC | 245 | 178 |
| CD | Not obtained. | 270 |
| DA | 216 | 10 |

Find the exact bearing of the side AB.

5. The following consecutive readings were taken with the help of a dumpy level:

1.904, 2.653, 3.906, 4.026, 1.964, 1.702, 1.592, 1.261, 2.542, 2.006, 3.145

The instrument was shifted after the fourth and seventh reading. The first reading was taken on the staff held on the BM of RL100 m. Rule out a page of level book, enter the above readings thereon. Calculate the RL's of the points and apply the arithmetical check.

6. What are the different sources of errors in levelling? How are they eliminated?

SECTION-C

7. A nominal distance of 30m was set out with a 30m steel tape from a mark on the top of one peg to a mark on the top of another, the tape being in catenary under a pull of 10 kg and at a mean temperature of 70°F. The top of one peg was 0.25 m below the top of other. The top of the higher peg was 460m above the mean sea level. Calculate the exact horizontal distance between the marks on the two pegs and reduce it to mean sea level, if the tape was standardised at a temperature of 60°F, in catenary under a pull of (a) 8 kg (b) 12 kg (c) 10 kg. Take radius of earth = 6370 km, density of tape = 7.86 g/cm³, section of tape = 0.08 sq.cm, coefficient of expansion = 6×10^{-6} per 1°F, Young's modulus = 2×10^6 kg/cm².
8. The following bearings were observed in running a closed traverse.

| Line | F.B. | B.B |
|------|---------|---------|
| AB | 71°05' | 250°20' |
| BC | 110°20' | 292°35' |
| CD | 161°35' | 341°45' |
| DE | 220°50' | 40°05' |
| EA | 300°50' | 121°10' |

9. Discuss various methods to solve three point problem.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.