10. a) Write briefly about temporary adjustments of a level. 4

b) Enumerate briefly the different types of levels used in levelling. 7

c) Distinguish between check levelling and profile levelling. 3

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# B.Tech Even Semester Examination, May, 2025

## Agricultural Engineering

(4th Semester)

### Course No: AE-402

*(Surveying and Levelling)*

*Full Marks: 70*
*Pass Marks: 28*
*Time: 3 hours*

**Note:**

1. Attempt any five questions taking one from each unit.
2. Begin each answer in a new page
3. Answer parts of a question at a place
4. Assume reasonable data wherever required
5. The figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

### UNIT-I

1. a) Distinguish between Plain Surveying & Geodetic Surveying. 7

b) Define surveying? What are the objectives of surveying? Briefly discuss the different uses of Surveying. 2+2+3=7

2. a) Define Scale of a Map. Discuss the different types of scales. 9

b) Following Consecutive staffs reading were taken with a level along a sloping ground line XY at a 4 regular intervals of 20m by using 4m levelling staff 0.352, 0.787, 1.832, 2.956, 3.758, 0.953, 1.766, 2.738, 3.872, 0.812, 2.325 and 3.137.Rule out a page of level field book, enter the reading RL of

point X is 120.280. Calculate RL of all points by Rise and Fall Method, and workout the gradient of line XY. 5

**UNIT-II**

3. a) Define: 8

i) Quadrantal bearing

ii) Reduced bearing

iii) Whole circle bearing

iv) Fore bearing

v) Back bearing

b) The magnetic bearing of a line is S $18^0$30' E. Calculate the true bearing if the magnetic declinations are $5^0$38' East and $5^0$38' West 6

4. a) Define local attraction. What are the methods of correction of traverse? 7

b) Distinguish between prismatic compass & surveyors compass. 7

**UNIT-III**

5. a) State the principle of levelling. What are the objectives of levelling? 8

b) The following staff readings were observed successively with a level the instrument is moved by third sixth and eighth readings. 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 m enter the reading in record book and calculate R.L using HI method. if the first reading was taken at a B.M of 432.383m 6

6. a) Briefly describe the different types of surveying

i) Based on Instruments

ii) Based on methods

iii) Based on purpose

iv) Based on nature of field 3×4=12

b) Define Plan. 2

**UNIT-IV**

7. a) What is Bench mark? State the different types of Benchmarks. 7

b) What are the different types of adjustments while setting of an instrument? 7

8. a) Define Reciprocal levelling. State the procedures for reciprocal levelling with a suitable diagram. 7

b) What is contour line? Give some characteristics of contour lines. 7

**UNIT-V**

9. Define : 2x7=14

(i) Magnetic meridian

(ii) Benchmark

(iii) Magnetic declination

(iv) Intermediate Sight

(v) Datum

(vi) RF

(vii) Forebearing