Practical No: 11 **Determine Reduced Level by Rise and Fall Method.**

I. Practical Significance:

If reduced levels of different points are known then it is very easy to know the nature or type of ground Planning of different construction activities is possible by considering nature of ground. Economica constructions are possible from knowledge of reduced levels. Reduced levels can be calculated by using Rise & Fall method in simple levelling, differential levelling, check levelling, fly levelling, etc.

II. Industry/Employer Expected Outcome(s):

- Calculation of Reduced Levels.

III. Course Level Learning Outcome (COs):

- CO4 - Determine Reduced Level to prepare Contour maps for the given type of terrain.

IV. Laboratory Learning Outcome (LLO):

- LLO 11.1 Undertake differential leveling by Rise and fall method using dumpy level/Auto Leve and leveling staff.

V. Relevant Affective Domain related Outcome(s):

- Follow safe practices.
- Maintain high standards of hygiene.
- Efficient application of tools, equipment's and machinery.
- Professional and ethical standards.

VI. Relevant Theoretical Background:

The Rise & Fall method is a technique used in surveying to determine the difference in elevations between two points .It is commonly used in design & construction to create site plans. In rise & fall method two simultaneous reading are compared. If second reading is lesser than first then difference is entered in rise & if second reading is greater than first then difference in readings is entered in fall. Levelling is the process of measuring vertical distances with respect to given datum. In this method complete check on every reading.

VII. Required Resources:

Sr. No.	Resource required	Particulars	Quantity
01	Dumpy/Auto level with tripod stand	As per IS Standard	1 nos.
02	Levelling staff	4m	2 nos
03	Field book for recording readings	As per standard norms of field book page	1 nos

VIII. Precautions to be followed:

1. Perform temporary adjustments precisely.
2. Hold the staff truly vertical.
3. Read staff reading accurately.
4. Record the reading accurately in the level book.

IX. Procedure:

1. First collect the all instruments as per mentioned in point no VII from the survey lab.
2. Mark the staff stations on the ground whose elevations are to be found.
3. Set up the level approximately midway between the stations and perform temporary adjustments.
4. Swing the telescope towards the staves and observe and record the staff readings in the appropriate columns of the level book.
5. Find the elevations of the points by rise and fall method.
6. Return back the instrument to survey store.
7. Record field book page.

X. Observation Table:

Inst. Station	Staff Reading			Rise	Fall	Reduced Level	Remark
	BS	IS	FS				
1	0.794					820.765	BM
2		1.543			0.749	820.086	
3		2.796			1.253	818.765	
4	0.854		2.916		0.120	818.643	CP1
5		0.592		0.262		818.965	
6		0.482		0.110		819.015	
7	1.432		0.151	0.331		819.346	CP2
8		0.896		0.536		819.882	
9			2.035		1.139	818.743	
	3.808		5.102	1.239	3.261	-2.022	

XI. Result:

1. Elevation of A=
2. Elevation of B=

XII. Interpretation of Results:

The elevation of point A is 100.000m and the elevation of point B is 84.716 m. indicating a difference in elevation of 15.284 m

XIII. Conclusions:

The practical successfuly demonstreted the application of the rise and fall method.

XIV. Practical Related Questions:

1. State the situation where Rise & Fall method is adopted.
2. Write arithmetic check used in Rise & Fall method

Space for Answer

Q. 1 ⟶ ?

Ans:- Establishing elevations for engineering projects :- road construction, building creating topographic map:- where accurate elevation data is required

Any survey where precise elevation difference are esential.

Q. 2 ⟶ ?

Ans:- sum of Backsights (BS) - sum of foresights (FS) = last reduced level - First Reduced level.

XV. Assessment Scheme

Sr. No.	Performance Indicators	Weightage	Marks Obtained
A.	**Process Related (15 marks)**	**60%**	
1.	Handling of equipment's & Survey Conduction	40%	
2.	Accuracy in length measurement.	20%	