



**3055 BA SANGAM COLLEGE**  
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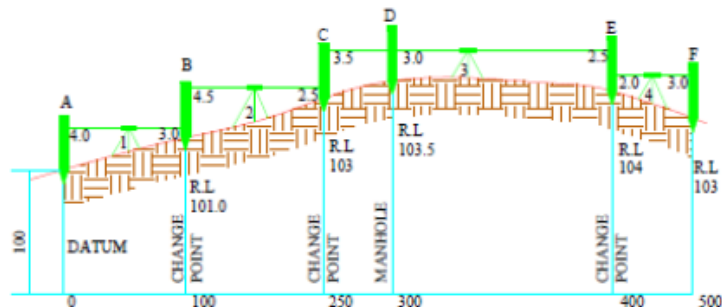
**School: Ba Sangam College**  
**Subject: Technical Drawing**

**Year/Level: 13**  
**WEEK 11**

**Name: \_\_\_\_\_**  
**Year: \_\_\_\_\_**

Strand	Geometrical Drawing
Sub Strand	Levelling
Content Learning Outcome	Define the terms and use the knowledge to practice levelling

**Method of carrying out Levelling**



**Steps in Levelling for the above setup (diagram)**

1. Set the Tripod with the Automatic level at station 1.
2. Hold the Staff at A, read and record the reading. It will be a Backsight (BS).
3. Transfer the Staff to B, read and record the reading. It will be a Foresight (FS).
4. Keep the Staff at B and set the Tripod with the Automatic level at station 2.
5. Take reading on B as it will be a Backsight (BS) and reading on C which will be a Foresight (FS).
6. Keep the Staff at C and set the Tripod with the Automatic level at station 3.
7. Take reading on C as it will be a Backsight (BS), the reading on D will be Intersight (IS) and the reading on E will be Foresight (FS).
8. Keep the Staff at E and set the Tripod with the Automatic level at station 4.
9. Take reading on E as it will be a Backsight (BS) and the reading on F which will be a Foresight (FS).

**Arithmetic Check**

The difference of the sums of the BS and FS should equal to the difference of the sums of Rise and the difference between the first and the last RL.

$BS - FS = Rise - Fall = Last RL - First RL$			
14	- 11	=	4.0 - 1.0 = 103.0 - 100.0
3.0	=	3.0	= 3.0

**Filling the Level Book or Field Book**

There are two methods of reducing level readings however, both are booked in the same manner. They are:

1. The Collimation method and
2. The Rise and Fall method. This is the generally preferred method.

**The Rise and Fall method**

For the Rise and Fall method, level sheets are ruled into columns as show

**Level Book**

BS	IS	FS	RISE	FALL	RL(m)	STAFF	DISTANCE (m)	REMARKS
4.0					100.0	A	0	Bench Mark
4.5		3.0	1.0		101.0	B	100	Change Point
3.5		2.5	2.0		103.0	C	250	Change Point
	3.0		0.5		103.5	D	300	Manhole
2.0		2.5	0.5		104.0	E	400	Change Point
	3.0			1.0	103.0	F	500	Finish
14.0		11.0		4.0	1.0			
14.0 - 11.0 = 3.0				4.0 - 1.0 = 3.0		103 - 100 = 3.0		CHECK

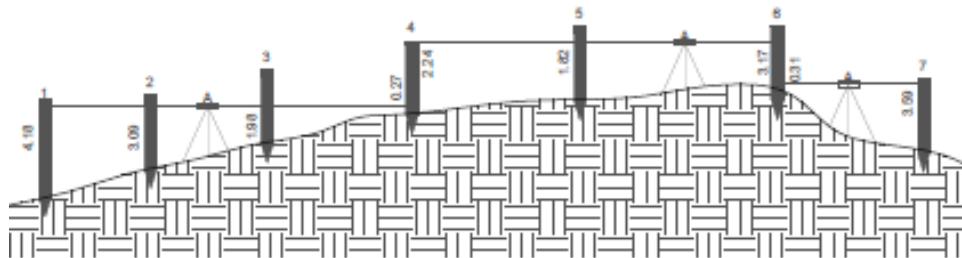
**Filling the Level Book**

1. The first reading of 4.0m is entered in the first row of the BS column.
2. The second reading of 3.0m is entered in the second row of the FS column.
3. The difference between BS and the FS which is 1.0m is entered in the second row of the Rise column because the value is positive (+). If the value is negative (-) than it will be entered in the fall column.
4. Since there is a rise, 1.0m is added to the RL which comes to 101.0m.
5. The Staff is labeled as B in the Staff column, 100m horizontal distance is entered in the Distance column and Change Point in the Remarks column.
6. The next BS (4.5) reading is entered in line (row) with the previous FS (3.0) reading and the process continues in the same manner.

### Activity (10 marks)

**GIVEN :** A Landscape of a proposed Road is given below. The positions and readings of the pegs and the theodolite from where readings were taken are also shown in the diagram.

**REQUIRED:** Using the information from the diagram complete the LEVEL BOOK.

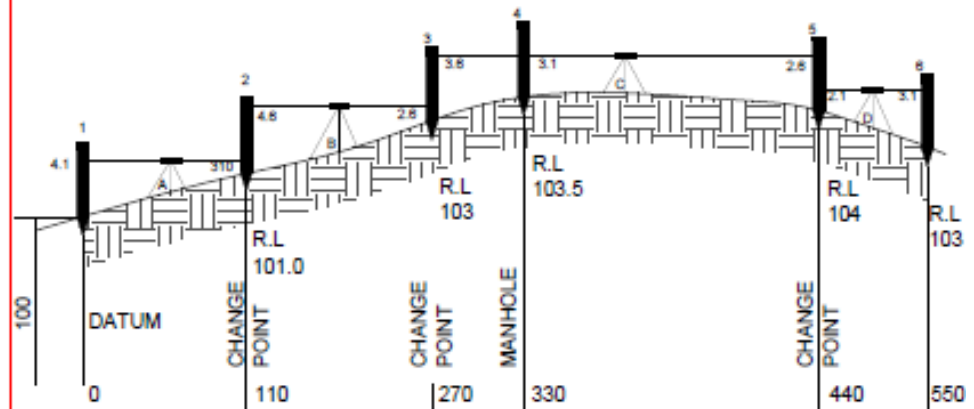


LEVEL BOOK

B.S	I.S	F.S	R.L	DST	STAFF	REMARKS
			100	0		Bench Mark
				100		Change Point
				250		Change Point
				300		Manhole
				400		Change Point
				500		Finish
				550		
						CHECK

**GIVEN :** A Landscape of a proposed road is given below. The positions and readings of the pegs and the theodolite from where readings were taken are also shown in the diagram.

**REQUIRED :** Using the information from the diagram complete the LEVEL BOOK.



LEVEL BOOK

B.S	I.S	F.S	RISE	FALL	R.L(m)	STAFF	DST(m)	REMARKS

**Note:** Complete a Check on the readings taken. Show this in the table.