Sushila Devi Bansal College of Technology

A.B. Road, Indore

Exp. 1 Normal consistency of cement

where cement is 300 grams

Sr No.	Water %	Reading (mm)
1	25%	40 mm
2	27%	32 mm
3	29%	20 mm
4	31%	12 mm
5	33%	6 mm

water consis. is 33%.

Exp. 2 Initial & final setting time

Cement = 300gms

water required = Cement wt. × water % × constant (k)

$= 300(gms) \times \frac{33}{100} \times 0.85 = 84.15 \cong 85\ ml$

∴ use 85 ml water for Initial & final setting time

(a) Initial Setting time

Sno.	time period (min)	Reading (mm)
1	0 mins	00 mm
2	5 mins	00 mm
3	10 min	00 mm
4	15 min	00 mm
5	20 min	01 mm
6	25 min	02 mm
7	30 min	04 mm
8	35 min	05 mm ✓

∴ Initial time = 35 min

for Final

(b) final

Let groove placed on surface of same sample on which we perform Initial setting time,
we observe that the groove does not penetrate on just showed impression on surface
The final setting time was around 10 to 11 hours

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3 Experiment - Compressive strength of bricks

Sample we require - 3 bricks

brick failure of 3 samples ⇒

1) 57 KN
2) 80 KN
3) 132 KN

Calculation = 57000 KN = 57000 N

Area of brick = (190 mm × 90 mm) = 17100 mm^2

Strength = $\frac{\text{load}}{\text{Area}}$ i.e = $\frac{57000\ N}{17100\ mm^2}$

= 3.33 N/mm^2

Same for sample 2 & 3 we get

Strength as 4.67 N/mm^2 & 7.72 N/mm^2 respectively

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Classification of bricks under strength as per IS.

1) Ist class brick => 10.5 N/mm^2
2) IInd class brick = 7 N/mm^2 to 10.5 N/mm^2
3) common building = 3.5 N/mm^2 to 7 N/mm^2
4) Sun dried bricks = 1.5 N/mm^2 to 2.5 N/mm^2
5) fly ash brick = 9 to 10 N/mm^2

S. No.	Load at failure (N)	Average Area of back faces (mm^2)	Compressive strength N/mm^2	Remarks
1	57000 N	17100 mm^2	3.33 N/mm^2	Jail
2	80000 N	17100 mm^2	4.67 N/mm^2	common building brick
3	132000 N	17100 mm^2	7.72 N/mm^2	IInd Class brick

Experiment 4

fineness modulus of fine Agg.

Sieve Size (mm)	wt. Retained (gm)	% wt Retained	(X) Cummulative % wt.	(100 - X) Passing
4.75	49	4.9	4.9	95.1%
2.36	23	2.3	7.2	92.8%
1.18	93	9.3	16.5	83.5%
600 µm	239	23.9	40.4	59.6%
300 µm	545	54.5	94.9	5.1%
150 µm	41	4.1	99	1
Last	10	1	100	00
	1000 gms.	100 %		

Σ

Calculation = Fineness modulus = $\frac{\text{Cum. \% wt retain}}{100\ \%}$

$= \frac{\Sigma 262}{100} = 2.62$

Exp. (5)

Slum cone test

Water cement ratio	Slump
0.5	30 cm
0.65	26 cm
0.75	21 cm

Recommended slump values for concrete for various jobs

S.No	Name of works	Slump (mm)	Water-Cement Ratio
1	Concrete for Roads and mass concrete	25-50	0.7
2	Concrete for RCC beams & slabs	50-100	0.55
3	Columns and retaining walls	175-125	0.45
4)	Mass concrete in foundation	25-50	0.70

Experiment 6

horizontal & Verticle angle measurment by theodolite

1) horizontal Angle by Repeatation method

S.No.	Reading	angle diffrence	Remark
1)	21° 40'	21°40'	Round 1
2)	43° 20'	21° 40°	Round 2
3)	62° 20'	19°	Round 3
		Total 62° 20'	

∴ horizontal angle = $\frac{62°20'}{3}$ = ~~20° 55'~~ 20° 45'

(b)

Vertical Angle measurment

S.No	Method	Reading
1	Face left	60° 40'
2	Face right	61° 40'
		Total - 122° 20'

Mean angle of face left & Right method is $\Rightarrow \frac{122° 20'}{2} = 61° 10'$

Experiment 7 : Check for local attraction & find Correct Bearing.

Line	F.B.	B.B	FB-BB	Interior Angle	Corrected value F.B	Corrected value B.B
AB	150°30'	329°45'	179°15°	109° 45'	150°	330°
BC	78°	256°30'	178°30'	107° 45'	77°45'	257°45'
CD	42°30'	223°45'	181°35'	145° 30'	43°15'	223°15'
DE	315°45'	134°15'	181°30'	91° 30'	314°45'	134°45'
EA	220°15'	40°15'	180°	85° 30'	220°15'	40°15'

all station have L.A except EA.

The traversing is Anticlockwise i.e. included Angle = interior Angle

∴ it is free from L.A. so

$\angle A$ = F.B of AB − B.B of EA = 150°30' − 40°15' = 110°15'

$\angle B$ = F.B of BC − B.B of AB = 78° − 329°45' + 360° = 108°15'

$\angle C$ = 42°30' − 256°30' = 146°

$\angle D$ = 315°45' − 223°45' = 92°

$\angle E$ = 220°15' − 134°15' = 86°

check theoretical sum of angle = (2n−4)×90° = 540°

Actual sum of Angle $\angle A + \angle B + \angle C + \angle D + \angle E$ = 542°30'

correction in each angle = 540° − 542°30' = −2°30'

Correction in each angle is = $\frac{-2°30'}{5}$ = −30'

Corrected Angle : $\angle A$ = 109°45' (110°15' − 30')

$\angle B$ = 107°45'

$\angle C$ = 145°30'

$\angle D$ = 91°30'

$\angle E$ = 85°30'

corrected

than again we use included Angle to determine the Bearing of affected (L.A.) i.e. EA is free from L.A (Local Attraction so) i.e. [F.B or B.B of EA is corrected]

$\angle A$ = F.B of AB − B.B of EA

$109°45' =$ F.B of AB $- 40°15'$

F.B of AB = 150° | B.B of AB = 150° + 180° = 330°

$\angle B$ = F.B of BC − B.B of AB

= F.B of BC = 107°45' + 330° − 360° = 77°45' | B.B = 257°45'

$\angle C$ = F.B of CD − B.B of BC

F.B of CD = 145°30' + 257°45' − 360° = 43°15' , B.B = 223°15'

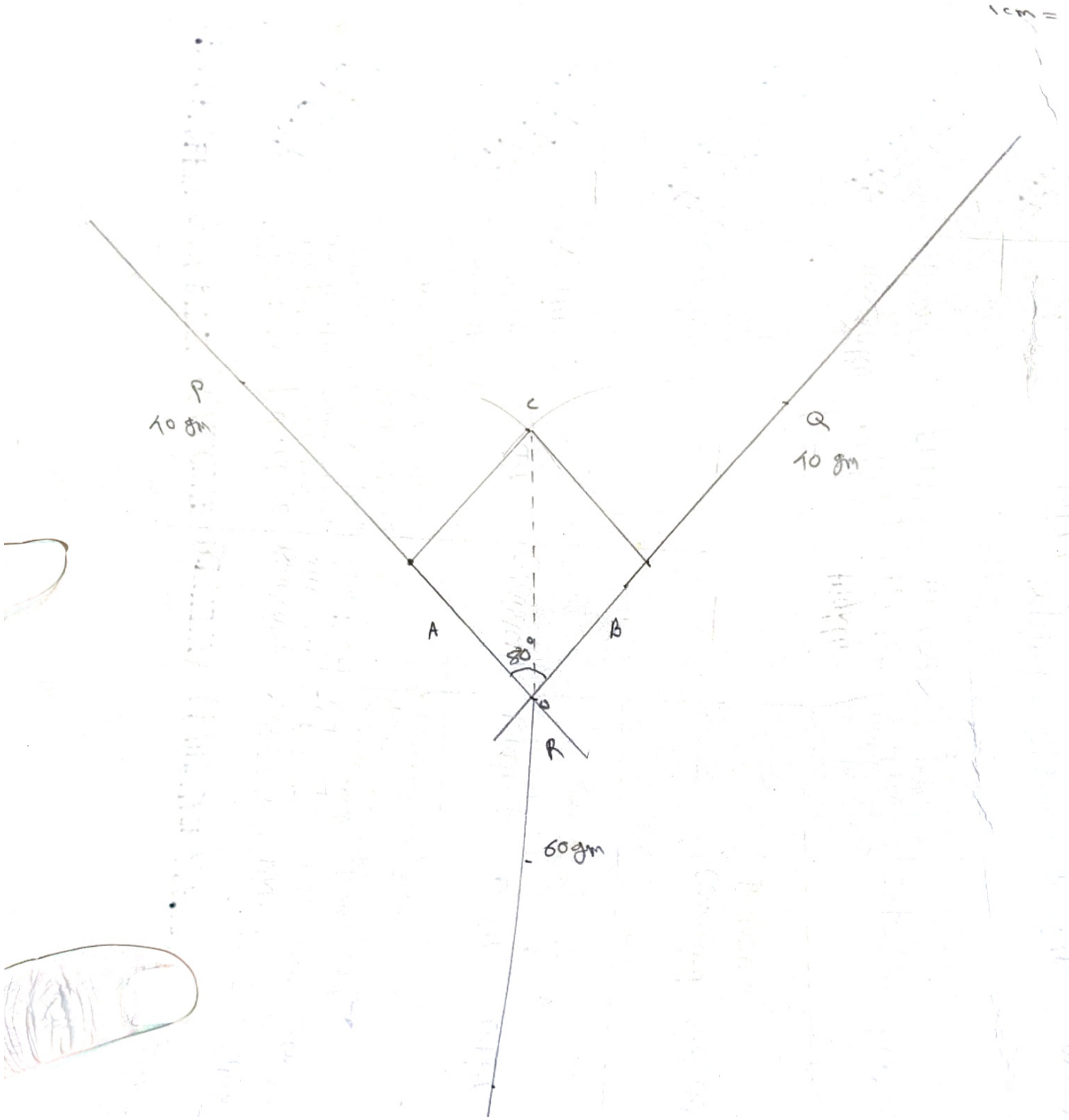
= Similarly we get

F.B of DE = 91°30' + 223°15' = 314°45' B.B. = 134°45'

F.B of EA = 220°15' | B.B = 40°15'

2. By Rise and Fall Method

Station	Distance	Readings			Rise Fall	R.L.	Remarks
		B.S.	I.S.	F.S.			
A	0	0.780				180.750	B.M.
	30		1.535		0.755	179.995	
	60		1.955		0.420	179.575	
	90		2.430		0.475	179.100	
	120		2.985		0.555	178.545	
	150	1.155		3.480	0.495	178.050	C.P.
	180		1.960		0.805	177.245	
	210		2.365		0.405	176.840	
	240	0.935		3.640	1.275	175.565	C.P.
	270		1.045		0.110	175.455	
	300		1.630		0.585	174.870	
B	330			2.545	0.915	173.955	
Arithmetical checks		ΣB.S. – ΣF.S. = 2.870 – 9.665 = –6.795			ΣRise – Σ Fall = 0–6.795 = –6.795	Last R.L.–First R.L. 173.955 – 180.750 = –6.795	


1 cm =
P
10 gm
C
Q
10 gm
A
B
80°
O
R
60 gm

91°
139°
139°
360°