

Name: Ziaullah ID NO 16588
 Section: B paper: Concrete Technology.

QNO1 Which step is taken to prevent flash setting of cement? Also, write steps to prevent false setting of concrete?

Ans. Step To prevent flash setting:

(1) A small amount of Gypsum are added to prevent a flash setting of cement.

(2) The addition of Gypsum should not exceed than 2 to 5%.

Step to prevent false setting:

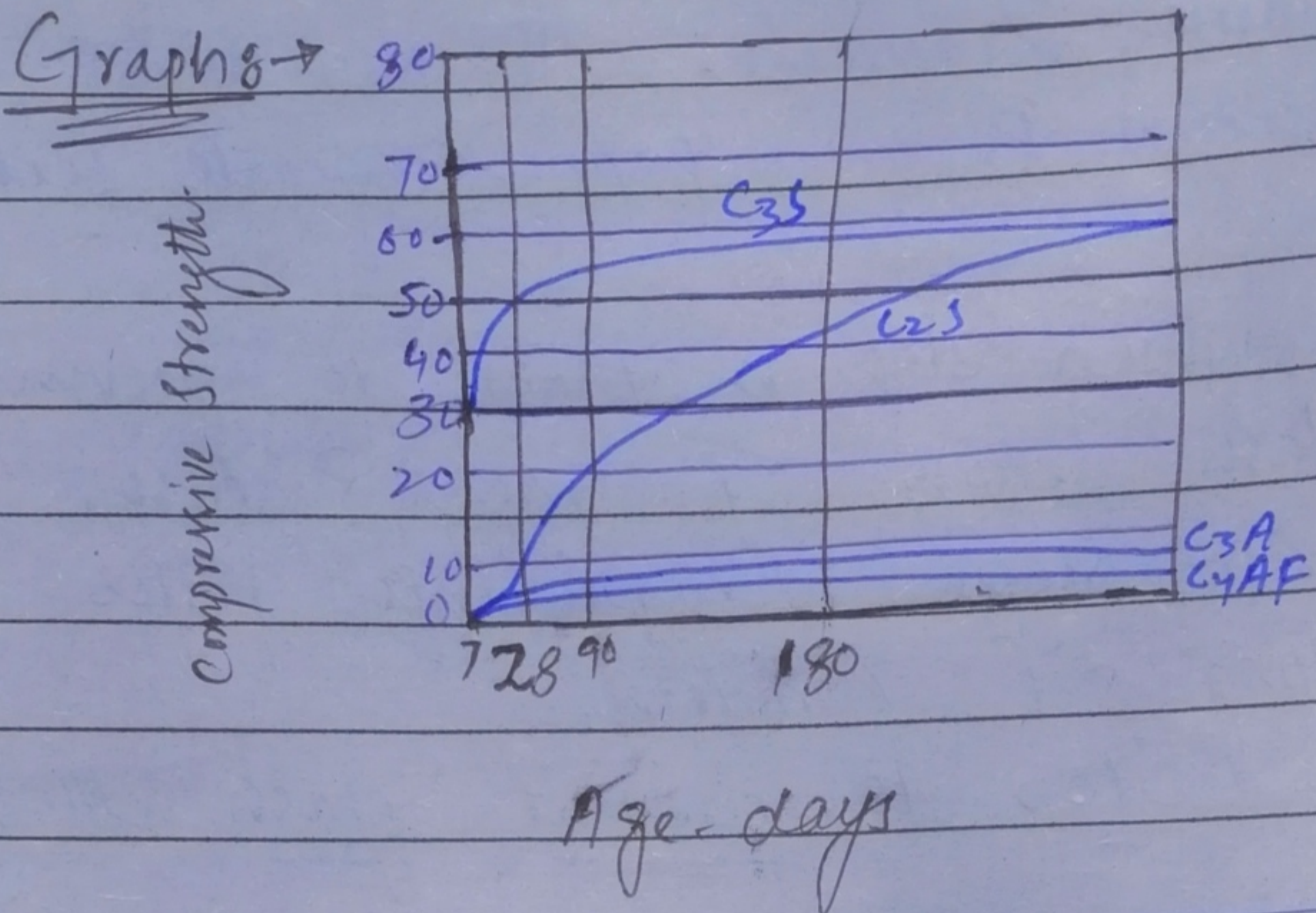
(1) The hardness of concrete can be regained by further mixing without the addition of water.

(2) In this method the cement paste came into its normal manner without loss in its strength.

QNO2 Draw a graph showing the strength development of pure compound of cement.

P.T.O

Ans

QNO3

Why Type III Cement is Rapid Hardening and Type IV low Heat producing? Draw a Graph Showing the development of heat of Hydration of different Type of Cement.

Ans.

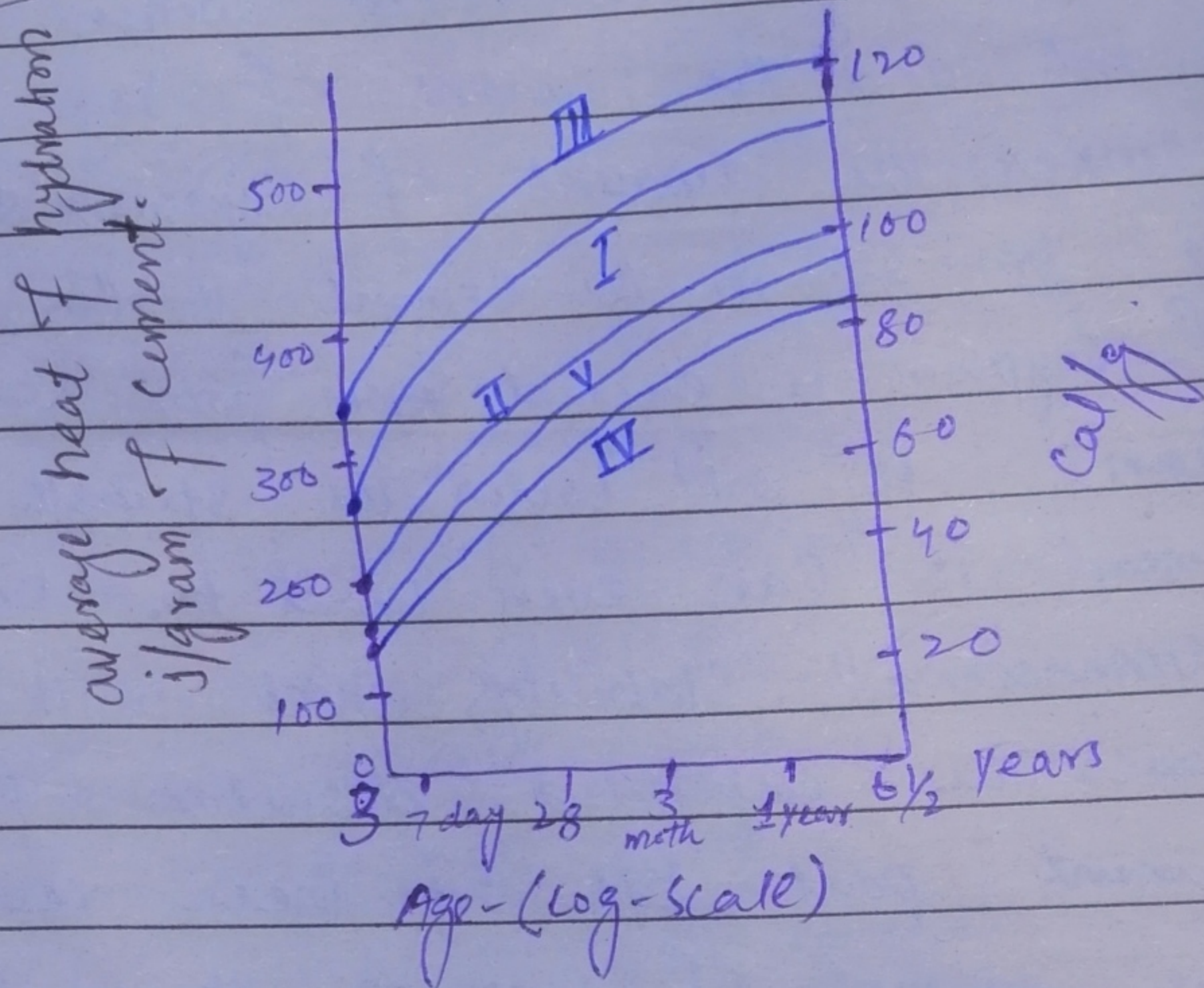
Type III Cement →

The Type three Cement is rapid hardening cement B/c it is Ground more finely, And have slightly more amount of Tri-calcium-silicate (C_3S).

Type IV Cement →

this Type of cement produced low heat B/c it contains low content of C_3S ($< 50\%$) and Tri-calcium-Aluminate (C_3A).

Graphs →



Q Nos Why is the percentage of gypsum added to cement limited only to 5%?

Ans Gypsum is also called retarding agent of cement which mainly used for regulating the setting time of setting. If the content of gypsum is very little, then the retardation affect will be unobvious. Too much gypsum will accelerate the setting time of cement. B/c gypsum can generate a clotting agent itself. The appropriate amount of gypsum depend on the content of C₃A in the

Cement and that of SO_3 in gypsum, and it also related to fineness of cement and the content of SO_3 in clinker. the amount of Gypsum should be 3% - 5% in the cement. If the content of Gypsum is exceed ~~more~~ from 3-5% than it will lower the strength of cement. it can even lead to poor dimensional stability, which will cause the expanded desruption of cement past. B/c of these reason the amount of Gypsum should be in the range b/w 3-5%.

Q No 6 what is the effect of following on the bond strength of concrete?

- (i) Shape of Aggregate (ii) Size of Aggregate
(iii) Texture of aggregate (iv) Bleeding

Ans (i) ~~size~~ ^{size} of aggregate: →

The bigger size aggregate have less surface area and required less water for the wetting. So bigger size of aggregate give higher workability. & smaller size of aggregate will give less workability. & also high bond strength of concrete.

(ii) Shape of aggregate :->

Shape of

aggregate will effect the bond strength of concrete. Rounded shaped or

Cubic shaped aggregate will give high strength to the concrete.

(iii) Texture of aggregate :->

Texture of

aggregate effect the bond strength of

concrete. If the total surface area

of rough textured aggregate is more than the surface area of smooth rounded aggregate of same volume & it gives strength to the concrete.

(iv) Bleeding :->

Bleeding is mainly observed in a highly wet mix, badly proportioned and deficient mixed concrete. in thin

member like roof slab or road slab

when concrete is placed in sunny

weather show excessive bleeding which

effect the bond strength of concrete

Q No 4

What is the effect of compaction on entrapped air of concrete? What will be the effect on strength if concrete is not compacted sufficiently? Explain with Graph.

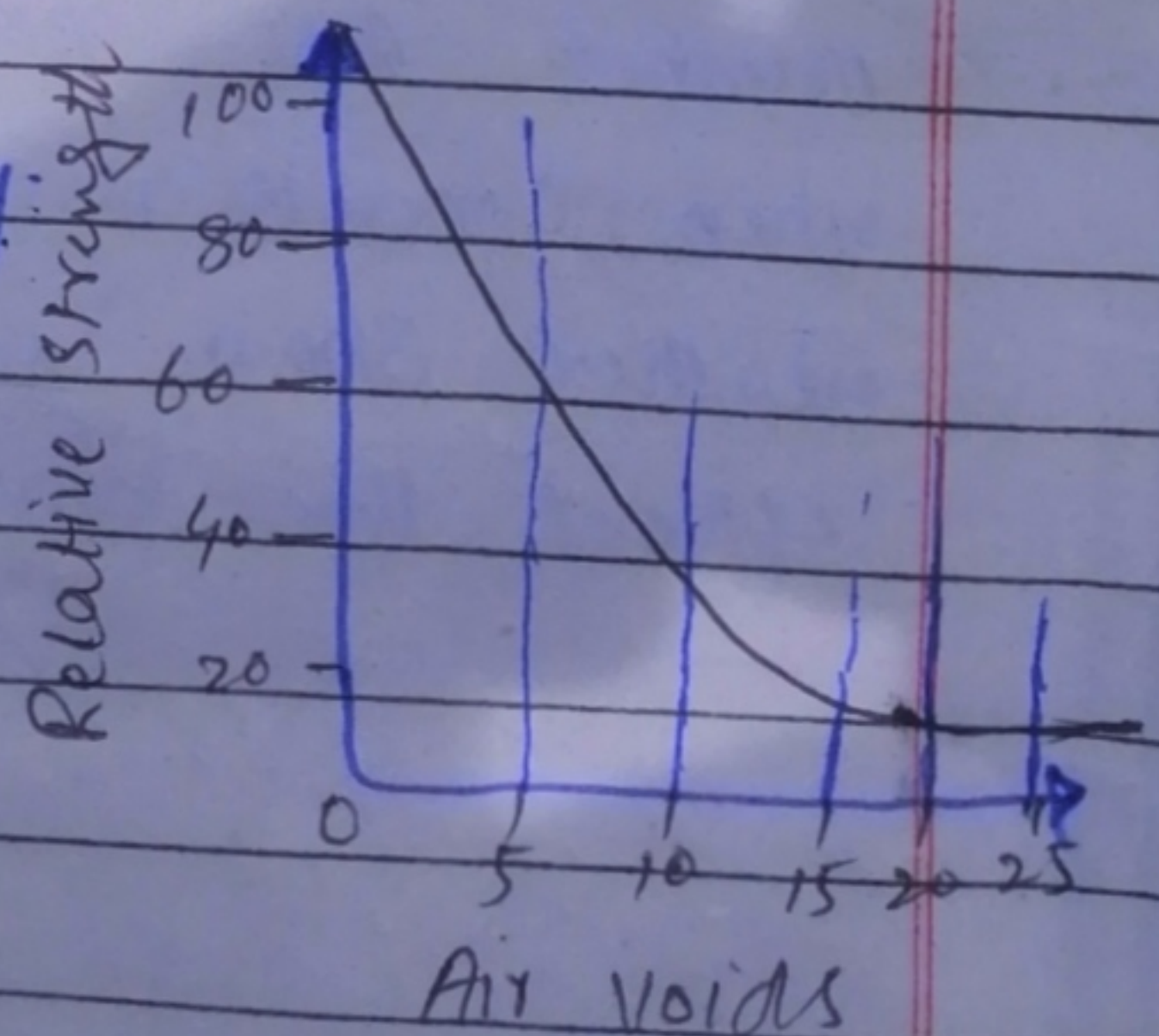
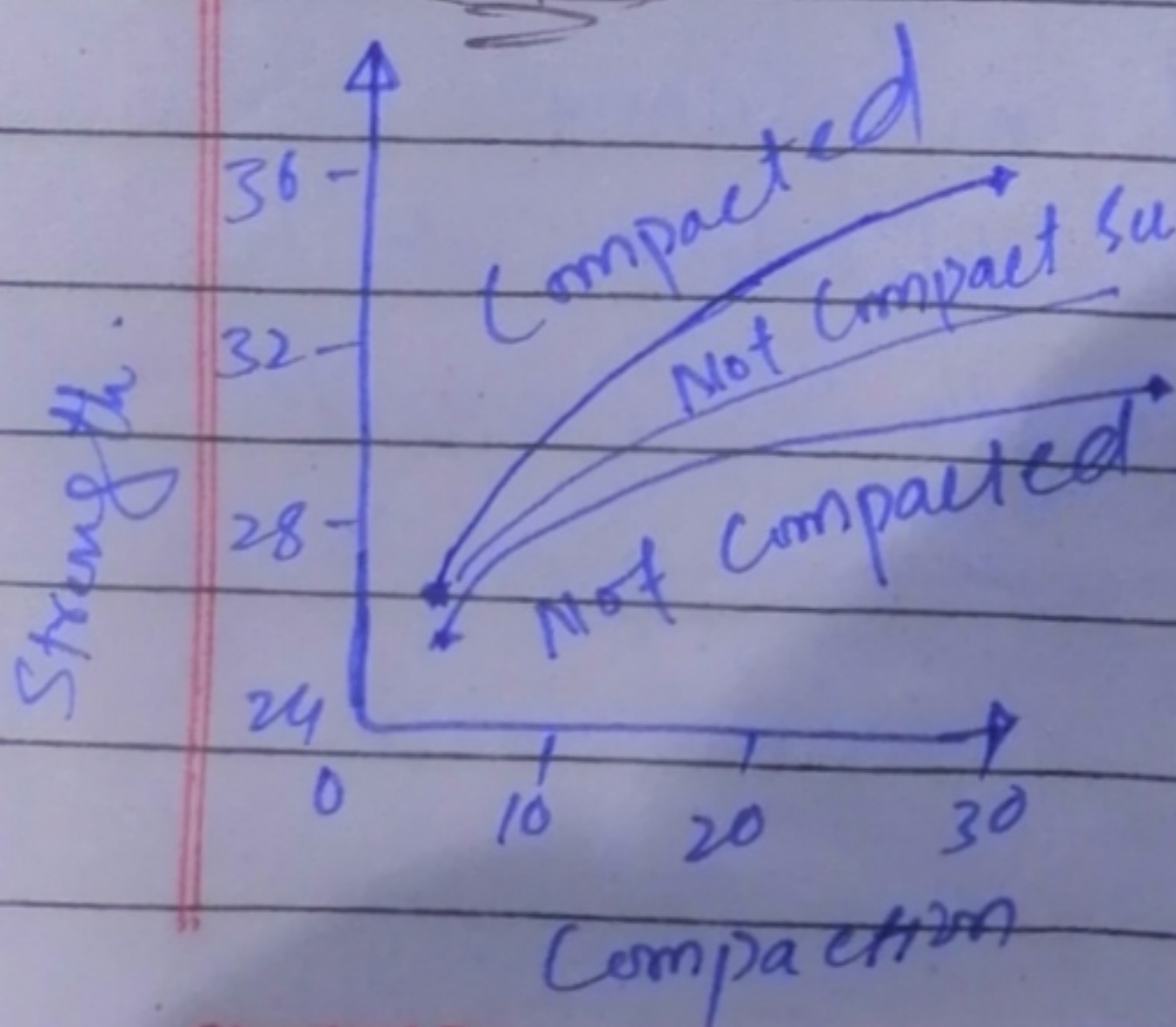
Ans

The strength of concrete containing 10% of air voids (entrapped air) may be little as compare 50% that of the concrete when fully compacted.

The effect of compaction on a strength of concrete is dramatic:

~~The~~ in addition ~~to~~ to expelling entrapped air promotes a more even distribution of pores within the concrete. Causing them to become discontinuous. This reduce the permeability of the concrete and hence improve strength and the durability of concrete.

Graph: →



Q NO7 what is the effect of following on workability of aggregate.

- (i) porosity and Absorption (ii) Air entraining agent (iii) Coarse aggregate to fine aggregate ratio (iv) Grading of aggregate.

Ans: (i) porosity and Absorption →

Most of the aggregate are porous & absorptive. If aggregate have more pores than it workability is less. And also if the aggregate absorb is more than its limit then it will effect the workability of aggregate.

(ii) Grading of Aggregate →

Grading of Aggregate will Maximum effect on workability of concrete. This help in reducing the voids in a given volume of aggregates. The less volume of voids makes the concrete more workable And vice versa. Well graded Aggregate ~~have~~^{gives} high workability to concrete.

(iii) Air entraining agent → Air entraining agent is effect the workability of aggregate as well as concrete.

The benefits of entraining air in the concrete includes increased resistance to freeze-thaw degradation, & increased cohesion (resulting in less bleed and segregation) and improve compaction in low workability mixes.

(iv) Coarse aggregate to fine aggregate ratio →

there is an optimum coarse to fine aggregate ratio for RCC. Increasing cement from 9% to 12% has significant effect on the property of RCC. Coarse to fine aggregate ratio influence the porosity of RCC. Relationship b/w tensile strength and compressive strength were determined.

Q No 8 → What is the effect of fineness of cement on the following? (i) Strength of concrete (ii) Rate of heat evolution during hydration (iii) total heat of hydration (iv) workability of concrete.

Ans → (ii) Rate of heat evolution during hydration →
If the cement is more finer than hydration is very high.

(ii) Total heat of hydration →
Cement react faster with water and the rate of development of strength and corresponding heat of hydration is high. the finer

(iii) workability of concrete →
Bleeding
Can be reduced by increasing fineness. However, increase fineness can also lead to the requirement of more water for workability. As a result in a higher possibility of dry shrinkage. thus ~~it~~ the fineness of cement effect the workability of concrete.

(iv) Strength of concrete →
finer cement is react with water & hydrate rapidly B/c of these reason More fineness of cement is effect the strength of concrete.

QNO9 what step can be taken during transportation and placement of concrete to prevent segregation of concrete?

Ans- Segregation is the separation of aggregate from the cement matrix. When the ~~concrete~~ concrete is poured freely from a height more than 1m, the aggregates will be thrown separately first and the cement matrix will follow them and accumulated at the top. Segregation as a result from external factor such too much ~~vibration~~ vibration improper transportation & placement et-c. we can avoid happening of Segregation by:

(1) the concrete mix should be properly designed with optimum quantity of water to make a cohesive mix. Such concrete will not exhibit any tendency for segregation.

(2) Choosing proper size of aggregates and aggregate to cement ratio.

(3) remixing at the sites.

(4) Applying viscosity Modifying Admixture which will give cohesiveness to the mix.

Checked By: Parents: Excellent Good Need Improvement

the end of paper.