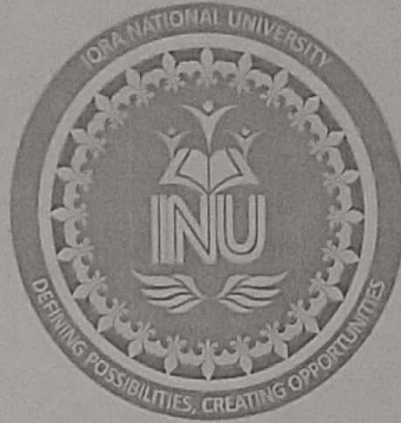


IQRA NATIONAL UNIVERSITY



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Q1 which step is taken to prevent flash setting of cement. Also, write steps to prevent false setting of concrete.

Ans Flash Set: It is the immediate stiffening of cement paste in a few minutes after mixing with water. It is accompanied by large Gypsum is added in cement to prevent flash set.

⇒ False Set:

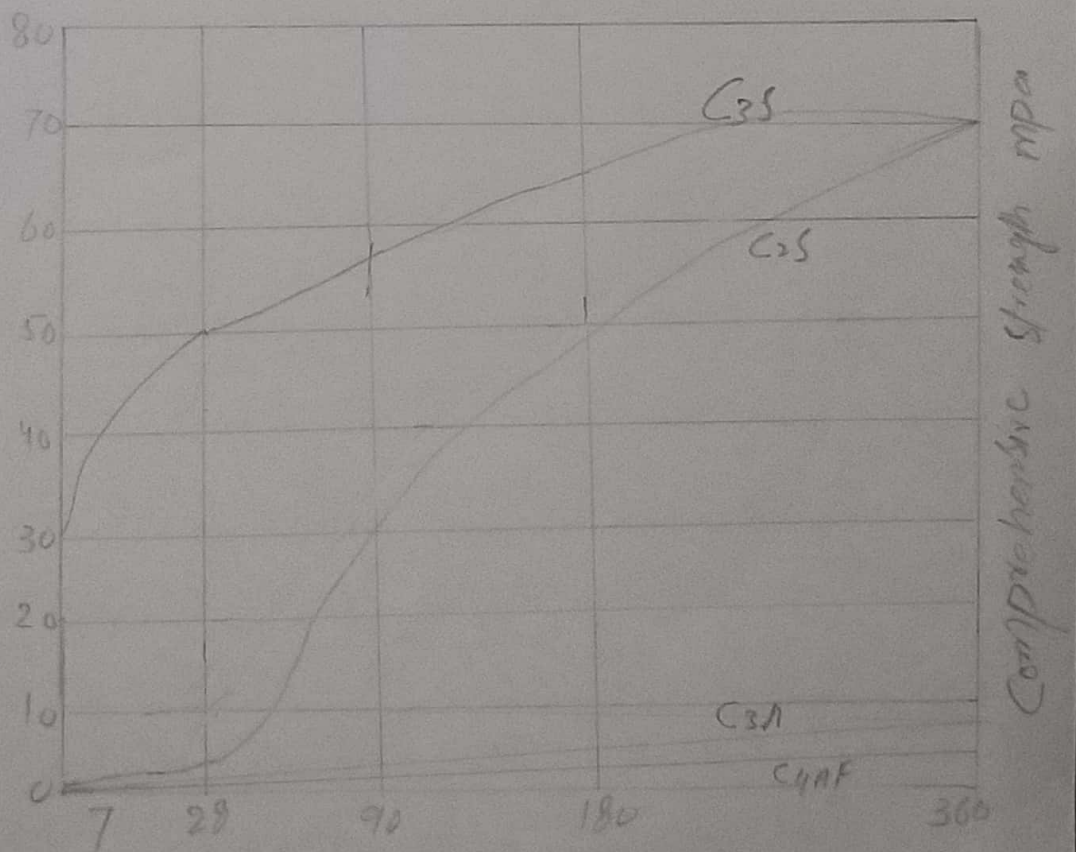
It is a rapid development of rigidity of cement paste without generation of much heat. This rigidity can be overcome & plasticity can be regained by further mixing without addition of water. In this way cement paste restores its plasticity & set is a ~~normal~~ normal manner without

any loss of strength. It may be due to hydration of gypsum as a result of connecting hot clinker or due to activation of C3S by a reaction in high humidity.

Q2

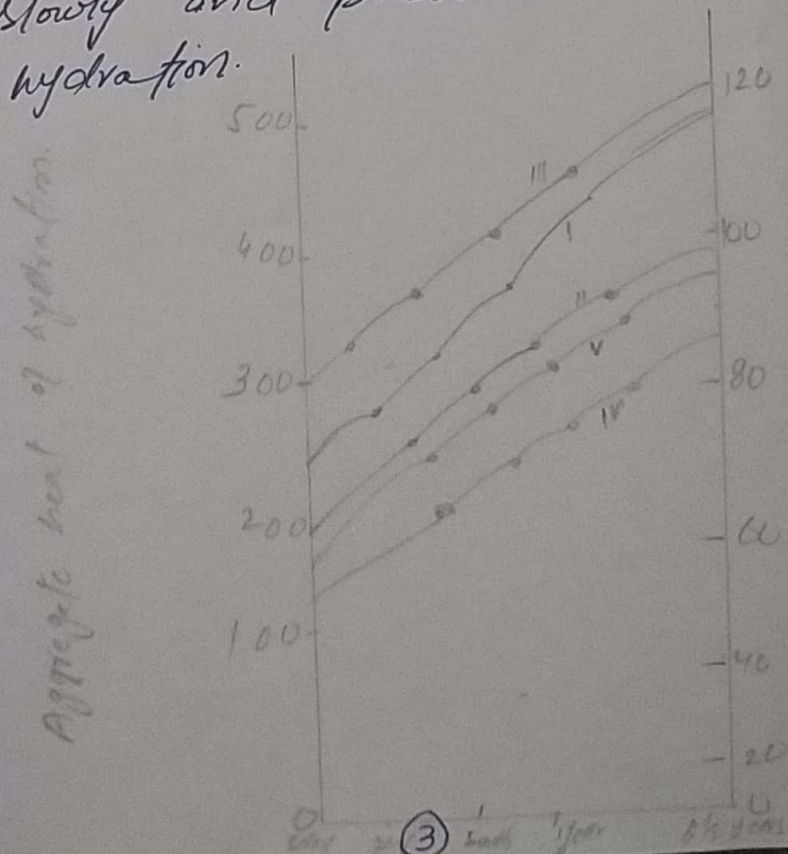
Draw a graph showing the strength development of pure component of cement?

Ans The following graph shows the strength development of pure compound of cement.



Q3 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 Cement types:

Ans: Type III cement is rapid Hardening because the component of type III is more finely ground with roller and ground and addition of more C₃A as compare to type III. while the low heat Producing of type IV is due to the low content of C₃A and C₃S the produced of types IV are less finely ground therefore the content react slowly and produce low heat of hydration.



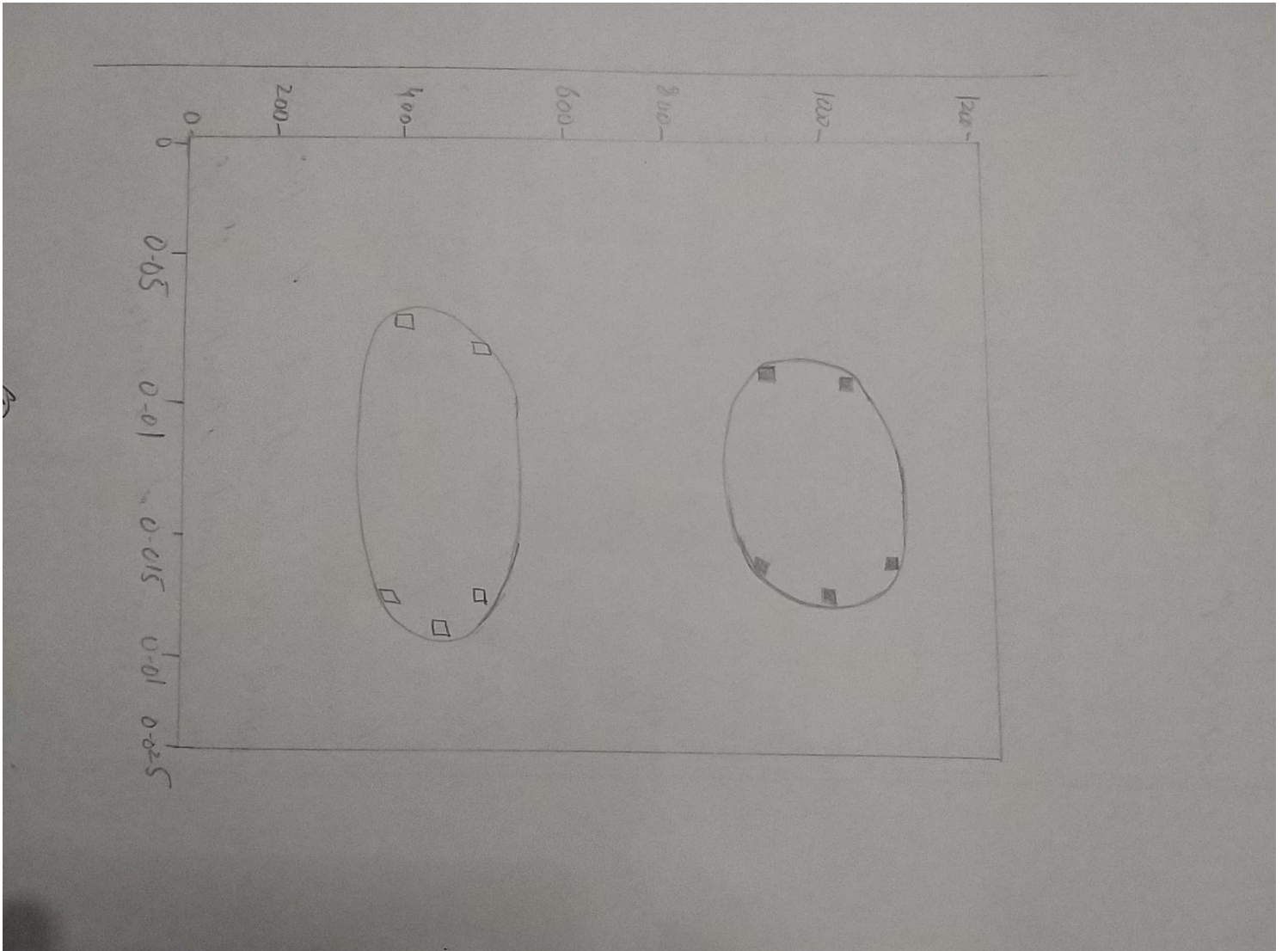
Q4: What is the effect of compaction on entrapped air of concrete? What will be the effect on strength if concrete is not compacted sufficiently? Explain with graph.

Ans Effect of compaction on entrapped air of concrete:

Compaction is the process which expels entrapped air from freshly placed concrete and packs the aggregate particles together. So it increases the density of concrete. Strength of concrete and entrance the bond with reinforcement.

Due to compaction of concrete segregation occurs. It creates the problem of ~~segregation~~ segregation which the denser aggregate settle to the bottom while the lighter cement paste tends to move towards.

⇒ Effect of non compaction: The effect of an strength if concrete is not compacted is that there will be no segregation.



Q 5

Why is the percentage of gypsum added to cement limit only to 5%?

Ans

Gypsum is a naturally occurring mineral mined from deposit formed by ancient seabeds as a raw materials.

Gypsum is called retarding agent of cement which mainly used for regulating the setting time of cement and is an indispensable component.

Gypsum 2% to 3% is added to cement in powder form to slow down the setting of cement. we add 5% of gypsum to slow down the setting of cement. About 3 to 5% gypsum is added to cement to slow down the setting

Q 6:

What is the effect of following on the bond strength of concrete?

i) Shape of aggregate:

The shape and texture of aggregate effect the property of fresh concrete more than hardened concrete.

The aggregate have smooth surface and improve workability and the regular surface generates a stronger bond between the paste and aggregate creating a higher strength.

Size of aggregate: Several factors including chemical, roughness and reinforcement with concrete. Therefore for bond strength when smaller size aggregate are used.

Texture of aggregate: The texture also effect the properties of fresh concrete and smooth surface can improve workability. Thus a rougher surface aggregate create a strong bond between the past and aggregate.

⇒ Bleeding = Bleeding in concrete may be considered as the physical movement of water towards the top surface. It is not always favorable as it increase finishing time, decrease strength and causes poor bonds between successive lifts.

Q7 What is the effect of following on workability of concrete?

Ans

Porosity and absorption:

Porosity and absorption will effect water/cement ratio and hence workability of concrete as well as bond b/w it and cement paste.

⇒ ii Air entraining Agent:

Air entraining agent effect compressive strength of concrete and its workability.

iii ⇒ Coarse aggregate to fine aggregate Ratio:

Fine particles require more water for a longer surface. Hence aggregate with finer particles needs more water make it workable. On the other hand bigger particles have less surface area. demand less water for wetting surface and require less amount of paste for lubricating.

(iv) Grading of aggregate. Graded aggregate tends to fill up voids and easily workable smaller amount of water can make it workable.

Q8

What is effect of fineness of cement on the following

(i) Strength of concrete.

The fineness of cement influences the drying shrinkage. Increasing fineness cause high strength.

ii. Rate of heat evolution during hydration. Heat of hydration generated from cement of higher fineness is large compared to coarse cement.

iii. Total heat of hydration. Finer the cement particles results in increase of total heat of hydration.

iv. Workability of concrete. The workability of non-air entrained concrete is increased by increasing the cement fineness.

Q9. What step can be taken during transportation and placement of concrete to prevent segregation of concrete?

Ans Segregation of concrete can be prevented by correctly proportioning the mix and using the recommended water cement ratio so as to prevent using excess water. Care should be taken while handling, transportation, compacting and also during finishing stages.