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 Section : A  
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 Subject : Concrete Technology.

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

Ans To prevent flash setting of cement Gypsum is used.

Step to prevent false setting of concrete :-

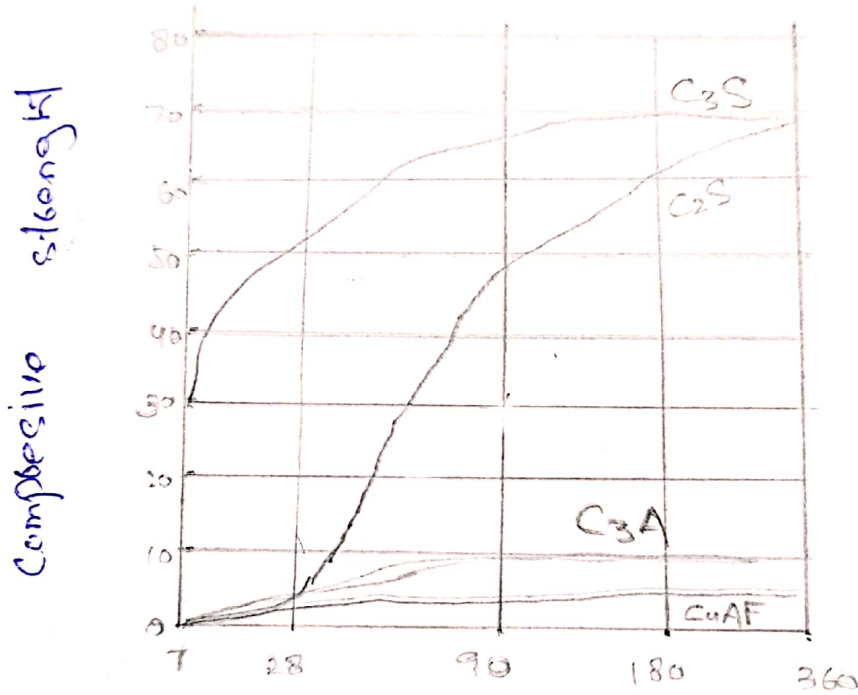
The following steps are used to prevent false settings.

- (i) It can be prevented by continuous mixing
- (ii) Reworking
- (iii) It can be supplied by the mixture to the site.

(2)

(1)

Draw a graph showing the strength development of pure compounds of cement.



Development of strength of pure compound.

Q 3 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.

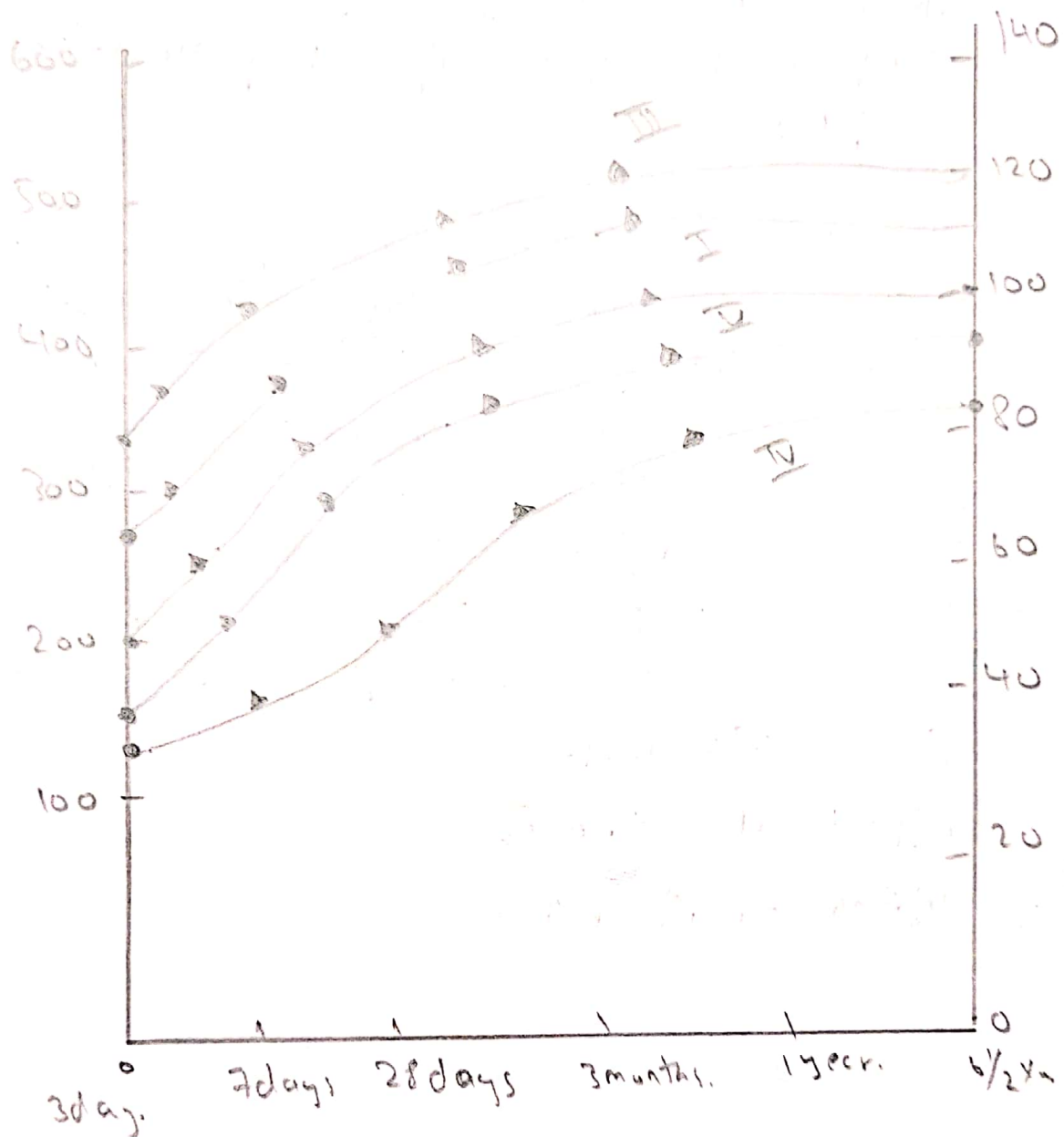
~~Type III:-~~

Ans Type III cement is rapid hardening because it has lesser curing time. It contains higher amount of C<sub>3</sub>S and It is identical to type I.

Type IV is low heat producing because its lower final and initial strength as compared to type I and it is achieved by reducing the percentage of C<sub>3</sub>A in cement.



Average heat of hydration: J/g of cement.



Development of heat hydration of different cement types.

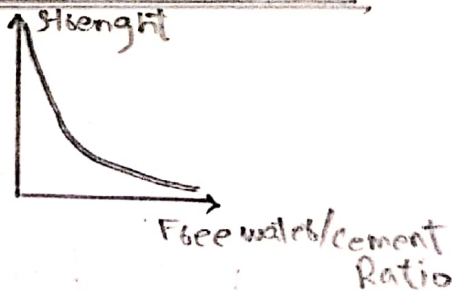
Q4 What is the effect of compaction on entrapped air of concrete? What will be the effect on strength if concrete is not compacted sufficiently? Explain with graph?

Answer (i) The effect of compaction on entrapped air of concrete is that increased compaction will reduce the amount of air entrapped. Because concrete is compacted the air bubbles escapes through the surface as it is destructed.

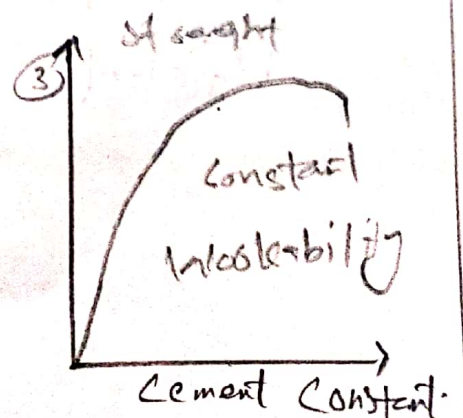
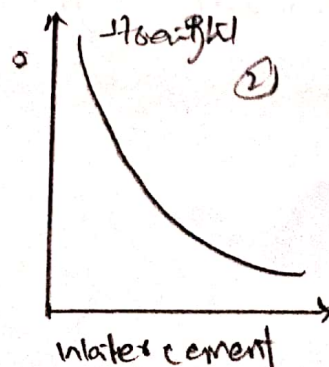
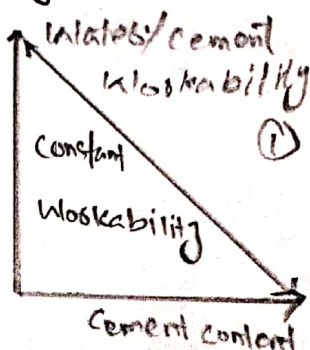
(ii) It is estimated that 50% of air entrainment is lost after compaction for 2 1/2 mint.

Effect on strength

(i) Water/cement Ratio:-



(ii) Aggregate/Cement Ratio



Q5 Why is the percentage of gypsum added to cement limited only to 5%?

- (i) It helps to control setting
- (ii) Drying shrinkage properties
- (iii) Strength development.

That's why it is limited only to 5%.

Q6 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) Shape of aggregate:

A smooth surface can improve workability while a rougher surface generates a stronger bond.

(ii) Size of aggregate: The <sup>compressive</sup> strength & splitting tensile <sup>strength</sup> decrease due to increase in aggregate size.

(iii) Texture aggregate: It can be either smooth or rough. A smooth surface can improve workability yet rough surfaces makes strong bond.

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(iv) Bleeding: If increase finishing time, produces laitance at the surface decrease strength water resistance and cause poor bonds.

Q 7 What is the effect of following<sup>on</sup> workability of concrete?

(i) Porosity and absorption.

Water cement ratio and workability concrete as well the bond between the cement paste and also affect the bond between it and also durability of concrete.

(ii) Air entraining agents

Its purpose is to increase the durability of the hardened concrete especially in climates subject to freeze its second season is to increase workability of concrete.

(iii) Course aggregate to fine aggregate ratio

It influence the porosity of RCCP and the relationship between compressive strength and tensile strength.

(iv) Grading of Aggregates It determine the average grain size of the aggregate before they use in construction.

Q8 What is the effect of fineness of cement on the following?

(i) Strength of concrete

The strength of concrete is depend on the fineness of cement more the cement is good more the cement is fine used in mixture of concrete.

(ii) Rate of heat evolution during hydration:

It is important because the concrete gets cool and the concrete gets weak there will be more cracke after the high temperature.

(iii)

Heat Hydration:

The when water and cement reacts the heat between them generates. It is more influence by the proportion of  $C_3S$  and  $C_3A$  in the cement.

(iv)

Workability of concrete:

It is the property of freshly mixed concrete of which it can be placed and mixed, increase in water increases the workability of concrete.



Q9 Steps can be taken during transportation and placement of concrete to prevent segregation.

- Ans. 1) Transport the concrete mix ~~be~~ correctly choose the shortest route for transportation from large heights.
- 2) The concrete mix should be properly designed with ~~an~~ optimum quantity of water.
  - 3) Use the vibrator to spread a heap
  - 4) Do not allow concrete to flow.
  - 5) If any segregation is observed in concrete remixing should be done soon to make it homogeneous again.