PNS SCHOOL OF ENGINEERING & TECHNOLOGY

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Internal Assessment Examination – 2023 (6th Semester)

Sub-Concrete Technology

Branch – Civil Engineering

1.(a)what is workability?

Workability of concrete is the property of freshly mixed concrete which determines the ease and homogeneity with which it can be mixed, placed, consolidated and it defines as "that property determining the effort required to manipulate a freshly mixed quantity of concrete with minimum loss of homogeneity". The workability of concrete depends on many factors which are explained in **factors affecting workability of concrete**. Water cement ratio has much effect in the workability. Workability is directly proportional to water cement ratio. An increase in water-cement ratio increases the workability of concrete.

(b)what do you mean by efflorescence?

Efflorescence is a deposit of salts, usually white, formed on a surface, the substance having emerged in solution from within either concrete or masonry and subsequently precipitated by evaporation. It occurs most readily in porous concrete near the surface. Efflorescence is not normally damaging, but it is aesthetically undesirable.

(c)what is creep in concrete?

Creep of concrete is the permanent deformation reported in a part of a structure due to the sustained load for a long time. Creep indicates that strain in the structure continuously increases, but stress remains constant

(d)what do you mean by M30 grade of concrete?

In the designation of a concrete mix, the letter 'M' and the number stands for Mix and characteristic compressive strength of 150 mm cube at 28 days. ∴ The M 30 grade of concrete means the concrete mix which attains 28 day strength (characteristics) as 30 MPa or 30 N/mm^2.

(e)what is curing of concrete?

Curing is the process of maintaining satisfactory temperature and moisture conditions in concrete long enough for hydration to develop the desired concrete properties. The potential strength and durability of concrete will be fully developed only if concrete is properly cured.

2(a) Improves properties of fresh concrete such as workability, cohesion and reduces segregation and bleeding. Improves properties of hardened concrete – For every 1% of air there is a 4% loss in strength which is minimized by the reduction in water content.

1. Air Entraining Admixture

These are generally used to improve workability, ease of placing, increased durability, better resistance to frost action and reduction in bleeding. The common Air-Entraining agents are natural wood resins, neutralized vinsol resins, polyethylene oxide polymers and sulfonated compounds.

2. Accelerating Admixtures

Accelerating admixtures are used for quicker setting times of concrete. It provides higher early strength development in freshly cast concrete.

3. Water Reducing Admixtures

Chemical Types for Water Reducing Admixtures

1. Calcium or sodium salt of lignosulfonic acid
2. Poly carboxylic acid

The principal role on mechanism of water reductions and set retardation of admixtures are usually composed of long-chain organic molecules and that are hydrophobic (not wetting) at one end and hydrophilic (readily wet) at the other. Such molecules tend to become concentrated and form a film at the interface between two immiscible phases such as cement and water, and alter the physio-chemical forces acting at this interface

4. Retarding Concrete Admixtures

The function of retarding concrete admixture is to delay or extend the setting time of cement paste in concrete. These are helpful for concrete that has to be transported to long distance in transit mixers and helpful in placing the concrete at high

temperatures, specially used as grouting admixture and water reducers results in increase of strength and durability.

2(b) Procedure for Concrete Slump Cone Test

1. Clean the internal surface of the mould and apply oil.
2. Place the mould on a smooth horizontal non- porous base plate.
3. Fill the mould with the prepared concrete mix in 4 approximately equal layers.
4. Tamp each layer with 25 strokes of the rounded end of the tamping rod in a uniform manner over the cross section of the mould. For the subsequent layers, the tamping should penetrate into the underlying layer.
5. Remove the excess concrete and level the surface with a trowel.
6. Clean away the mortar or water leaked out between the mould and the base plate.
7. Raise the mould from the concrete immediately and slowly in vertical direction.
8. Measure the slump as the difference between the height of the mould and that of height point of the specimen being tested.