

Name :- Shoaib Khan

ID :- 16358 .

Section :- B .

department :- BS (civil) .

Exam :- final term .

Subject :- Concrete Technology .

teacher :- ~~USAMA~~
usama Ali .

Q No 1 (A)

(1)

Answer: Re-tempering of concrete. when water is added to stiffened concrete or partially set fresh concrete in order to bring it back to the desired consistency or, workability. Then it is called "Re-tempering of concrete."

Re-tempering is done on the mortar board by the mason usually by dribbling water into the mortar pile, then reworking with trowel or shovel. This replaces water lost by evaporation.

Q No 1 "B"

Answer: For Agitating, a range from 2 to 6 rpm is sufficient. For mixing, the concrete drum must turn faster, with a minimum to 12 to 18 rpm.

(1) mixer generally run at speed 15-20 revolution per minute. (2) Normal 25-30 revolution are required for a well designed mixer to ingredient properly.

(3) mixing time is usually 1.5 to 2.5 minute and depend upon volumetric capacity of mixer. (4) Batching plant take 12 minute to load transit mixer of $6m^3$ capacity.

Q No 1 (A): part 1

2)

Answer: losses up to 40% were experienced when the concrete immediately exposed to freezing 24 hours if the risk of freezing damage is to be completely avoided and if temperature are to be conducive is to be ~~completely avoid~~ adequate early curing. Condition shall have a temperature of not less than 50°F and for this purpose, that concrete material shall be heated as required. However for concrete where a compressive strength greater than 3000 psi is required a planned revision to guide.

Q No 2 (B): part

Answer: Results indicate that, using membrane curing compounds, an efficiency of 80-90% can be achieved as compared to conventional water curing.

Q No 2 (C): part.

Answer: Strength Retrogression is defined as a change in the hydration product that are formed when cement is exposed to high temperature (< 110°C / 230°F). It can be describe as a decline of cement strength at elevated temperature where decreased strength is observed with increasing time.

Three method of Reducing weight are used: Additive such as bentonite, Attapulgite, pozzolons, or sodium silicate will permite use of increased. At temperature above 230°F bentonite, with its high water requirement, promotes strength Retrogression during properties compressive strength. psi Bentonite.
Curing time hrs water gal/sk weight lbs/gal volum cu tsk qsf
800 psi 160°F 1600 psi.

Q No 3: (A) part

(3)

Answer: meaning endurance: Endurance can be define AS The Ability to ~~Endurance~~ continuous to Endure a stress, Hardship or level of suffering. Endurance level of concrete:

Endurance limit Expressed as percentage of modulus of rupture of plain concrete. The Endurance limit is define as the maximum Flexural fatigue stress at which the beam could with ~~stand~~ stand a million cycles of nonreversed Fatigue loading Expressed as a percentage of modulus of Rupture of plain concrete.

Q No 3: "B" part:

Answer: Sliding and Scraping of concrete surface can cause Attrition and in Hydraulic structure, action of water can cause erosion of concrete. Damage of concrete due to Abrasion depends upon cause of water.

Q No 3 "C" part:

Answer: Strength of Bond depends upon the friction between steel and concrete. The Bond strength increase with increase in compressive strength of concrete. Deformed (ribbed) Bars should be used to increase friction between reinforcement and concrete.

Q. No. 4.

(4)

Answer: Creep:- as the elastic and long-term deformation of concrete under a continuous load.

Generally, a long term pressure change the shape of concrete structure and the deformation occurs along the direction of the applied load. when continuous load is removed, the strain decreased immediately.

⇒ These two type of curing reduce the drying shrinkage by half as much as they reduce creep.

Other factor affecting creep include type of cement, amount of cement paste, size and shape of concrete. Amount of reinforcement (Rebar), volume-to-surface ratio, temperature and humidity.

⇒ Two terms are some time used interchangeably although they are really different. Creep is an increase in plastic strain under constant stress.

Stress Relaxation is a decrease in stress under constant strain. Creep is an increased tendency toward more strain and plastic deformation with no change in stress.

Q No 52

(5)

Answer: If the volume reduction occurs before the concrete hardens it is called plastic shrinkage. The volume reduction that occurs primarily due to ~~mo~~ moisture loss after the concrete has hardened is known as drying shrinkage.

It can be significant in concrete with a very low water-cementitious material ratio.

→ Drying shrinkage gradient through the depth of a concrete slab can be divided into permanent and transient components because a portion of shrinkage is reversible. The amount of the reversible shrinkage for standard paving concrete made with virgin, recycled concrete. That is approximately 30% of shrinkage was reversible for standard paving mixture exposed to cyclic wetting and drying. The aggregate used however, the level of shrinkage reversible shrinkage increased significantly under long-term initial moisture curing and also corroborate the long held assumption that the length change of concrete specimens is proportional to their weight change due to moisture movement.

Q No 6: (A) part:-

(6)

Answer:- In addition to Sulphate present in Sea water, chloride ~~pruents~~ are also present. The prance of chloride prvents expansion of concrete unlike Sulphate attack. But increase porosity of concrete over time, Resulting decrease in strength.

⇒ Expansion of concrete above High level of water due to Crystallization of percolated salt can occure which can be prevented By making concrete impermeable. concrete subjected to Alternate wetting and drying is severely Attacted while concrete that is constantly wet is least Affected.

⇒ Concrete Exposed to sea water should have ~~low~~ w/c below 0.45 it should have low permeability. it should be well compacted with good workmanship, especially in the construction joints.

Q106: "B" part:

(7)

Answer:

Step 1: Slump = 50mm

Step 2: max size of Aggregate = 25mm

Step 3: quantity of water = 180 kg/m³.

Step 4: Average strength of concrete.

28 day of strength of concrete = $x + y + 5$.

$$= 8 + 8 + 15$$

$$= 31 \text{ MPa}$$

we can use the 2nd question.

$$f_m = 31 + 8.5$$

$$\text{OR } = \boxed{39.5 \text{ MPa}} \rightarrow \text{we can take this value.}$$

$$f_m = 1.1 + 31 + 1.5$$

$$= \boxed{33.6 \text{ MPa}}$$

~~probail~~

probability of air content = 1.5%

Step 5: water cement ratio = ? (8)

we can find from table 19.1

$$w/c = 0.41$$

$$\text{Cement quantity} = \frac{w}{w/c} = \frac{180}{0.41} = 439 \text{ kg/m}^3$$

Step 6: Quantity of coarse Aggregate =
we can find from table 19.9

$$C.A = 0.69$$

$$\text{weight of C.A} = 0.69 \times 1600 = 1104 \text{ kg/m}^3$$

Step 7: Quantity of F.A By volume method.

$$\text{weight of C.A} = 2.65 \left(1000 - \left[\frac{439}{2.4} + \frac{180}{1} + \frac{1104}{2.7} + 15 \right] \right)$$

$$C.A = 2.65 [1000 - 139.3 - 180 - 408 - 15]$$

$$C.A = 2.65 [257.7]$$

$$C.A = 682.9 \text{ kg/m}^3$$

p.t.o

Step 8: For 1% Absorb⁽⁹⁾ad $c.A = \frac{1}{100} \times 1104$.

$$c.A = 11.04 \text{ kg}$$

Step 9: For 2% moisture present in F.A That will added after mixture

$$\frac{2}{100} \times 682.9 \text{ kg/m}^3 = \boxed{13.65 \text{ kg}}$$

Net quantity of water = $185 + 13.65 = 1104$.

$$= \boxed{187.61 \text{ kg}}$$

Net quantity of c.A = $1104 - 11.04$.

$$= \boxed{1092.96 \text{ kg}}$$

Net quantity of F.A = $682.9 + 13.65$

$$= \boxed{696.55 \text{ kg}}$$

Final quantities:

$$\boxed{\text{Cement} = 439 \text{ kg/m}^3}$$

$$\boxed{\text{Water} = 187.61 \text{ kg/m}^3}$$

$$\boxed{\text{F.A} = 696.55 \text{ kg/m}^3}$$

$$\boxed{\text{c.A} = 1092.96 \text{ kg}}$$