Answer #1 (a)

Retempering of Concrete :-

(i) The process of water to concrete in addition to required quantity of water is known as retemring of concrete. Some time extra cement is also added while retempring.

(ii) Retempring is done owing to loss of workability or undue stiffness of Concrete at actual side in case a long tunnel, roads construction etc. where batching Plant is few kilometer away.

- Retempering is done on the morter board by the mason, usually by dribbling water into the mortar pile, then reworking with a trowel or shovel. This replace water lost by evaporation.

Answer # 1 (b)

RPM of the Agitator of transit Mixer :-

↳ Mixer generally run at a Speed of 15 - 20 revolution per minute.

↳ Normally 25-30 revolution are required for a well designed mixer ingredients properly

↳ Mixing time is usually 1.5 to 2.5 minute and depend upon volumetric capacity of Mixer.

↳ Batching Plant take 12 minutes to load a transit mixer of 6m³ capacity.

⇒ Standard Specification for ready-Mixed concrete Agitator ASTM (C685/C685M) volumetric Batching and continous mixing and placing Concrete. Tolerance at 30% or greater of full scale capacity. Stationary mixing time should be minimum. Mixing time or drum revolution not exceeded.

Answer # 2(a)

Ans Standard crush strength are very difficult to perform and reproduce due to excessive cracking of the samples It has been proposed that the reason for the cracking is the rapied release of the ~~capacity~~ confining pressure during the tests which may not. while this clain may appear valid. This study used samples cured bath under 3000 PSI confining pressure and under most conventional cement system do hat allow for high strength development and extended working time like thase seen.

Answer # 2 (B)

Ans Result indicate that using membrane curing compound an efficiency of 80 - 90% can be achived as compared to conventional water cuting.

Answer #2 (c).

Ans **Retrogression of Strength :⇒**

Retrogression of Strength is defined as a change in the hydration Product. That are formed when cement is exposed to high temperature (>160°c or 230°F). It can be describe as a decline of cement strength at elevated temperature where decreased strength is observed with increasing time.

Answer# 3 (a)

Endurance :-

The ability of an organism to exert it self and remain active for a long period of time as well as its ability to resist ; with stand , recover from, and have immunity to trauma , wonds or fatigue.

Answer # 3 (b)

Attrition of concrete :-

→ It is a test to measure the resistant of a granular material to wear. Example of material subjected to an attrition test are stone used in road construction.

Erosion of concrete :-

→ Erosion is the deterioration of concrete surface as a result of particles in moving water scrubbing the surface.

Answer # 3 (c)

Ans → The use of methyl cellulose (0.4 % to 0.8 %) by weight of cement in cement paste.
→ Concrete was found to increase the shear bond strength with steel reinforcing bar, steel fiber.
→ The bond strength increase with increase in methyl cellulose.

Answer# 4

Creep :-

→ The increase in strain of concrete with in passage of time under sustained stressed is called creep.

→ All materials exhibit the phenomenon of creep but in concrete its considerably more

→ The deformation of materials under design stress is termed elastic of and the subsequent increase in deformation under sustained design stress in creep.

→ If loaded concrete specimen is retrained in such a way that strain over time remain constant. Creep will manifest itself in the form of progressive decrease in stress over time

→ Creep is not a completely reversible phenomenon.

Factor affecting Creep :-

→ Stiffer the aggregate lower the creep. More the content of aggregate per unit volume of concrete lower the creep.

→ Decrease in W/C causes decrease in Creep. In other words strength and creep and inversely proportional.

→ Creep is smaller when concrete is cured at high temp because strength is higher than when cured and loaded at high temperature.

→ Creep also depends upon the applied stress. the relationship is directly proportional.

→ Creep also depends on the type of cement. High alumina cement expresses less creep as compared to ordinary portland cement.

Difference b/w Creep and Strain relaxation:

Two terms are Sometimes used interchangebly, 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.

Answer #5

Difference b/w drying shrinkage and plastic Shrinkage :-

Drying Shrinkage :-

The volume reduction that occour primarily due to moisture loss after the concrete has hardend is known as drying Shrinkage.

→ This Shrinkage causes an increase in tensile stress, which may lead to cracking, internal warping and external deflection before the concrete is subjected to any kind of loading

Plastic Shrinkage :-

→ Plastic Shrinkage occurs in a freshly mixed concrete with loss of water by evaporation from its surface, after placing and before hardeing of the concrete

→ This can lead to Plastic Shrinkage cracking if the rate of evaporation is higher than that of the bleeding water rising to the surface of the concrete.

Answer#6 (A)

Ans The strength of concrete reduces when sea water is used for mixing it can also corrode the reinforcement in certain cases which can lead to massive structure failure. However some research workers says that sea water can be used in un-reinforced concrete or mass concrete.

The bond strength increased by 3-11 % after 28 days and by 2-11 % and 4 % after 90 days. for mixed cured in fresh and seawater respectively with the use of dolomite rather than gravel for concrete mixed and cured in fresh water as well as sea water.

Answer # 6(b)

Steam = 50 mm

Aggregate size = 25 mm

w = 185 = A.C = 2%

Area Strength of Concrete

$$fm = fmin + 7$$

$$fm = (9 + 3 + 15) + 7$$

$$fm = 29 + 7$$

$$fm = 34 \text{ MPa}$$

W/C Ratio Table 19.2

W/C = 0.48 (Near to 34.5 MPa)

Quantity of cement

$$w/w/c = \text{Quantity}$$

$$C = \frac{185}{0.48}$$

$$C = 385.42 \text{ kg/m}^3$$

Quantity of CA (Table 19.9)

CA = 0.69

weight = 0.69 × 1600

= 1104 kg/m³

Quantity of FA (Volume Method)

$$= 2.65 \times \left[1000 - \left[\frac{385.42}{3.15} + \frac{185}{1} + \frac{1104}{2.65} + 25\right]\right]$$

$$= 2.65 \times [251.057]$$

$$= 665.28 \text{ kg/m}^3$$

I.C. Absorbed Moisture.

$$\frac{1}{100} = 1104$$

$$= 11.04 \text{ kg}$$

For 2% of Moisture Present in

$$2/100 \times 665.28$$

$$= 13.31 \text{ kg}$$

Net Quantity of water = 182.73 kg

Net Quntity of F.A = 678.59 kg

Final Result :

Cement = 385.42 kg

water = 182.73 kg

C.A = 1115.04 kg

F.A = 678.59 kg