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SECTION :- A

SUBJECT :- CONCRETE TECHNOLOGY

DEPARTMENT :- Bs (CIVIL ENGINEERING)

SUBMITTED TO :- SIR USAMA

QUESTION NO 3:=

(A) what do you mean by enderuance level ?what is the enderuence level of concrete and steel?

Answer :-

fatigue (s) decrease as the number of cycle increases the minimum value of s below which failure does not occure is known as endurne level

Endurne level also related to sufferance resilience constitution fortitude and hardness of the organisms is the ablity to exert itself and remain active for a long period of time as well as to its ablityu to resist withstand recover from have the immunity to turma wounds or fatigue

Steel:s=0.5 strength concrete does not a minmum endurenc level

(B):what is the different between attrition and erosion of

concrete?

Ans:

Attrition:-

sliding and scraping of concrete surface can cause erosion attrition

Erosion:

in hydarlic structure action of water can be cause erosion of concrete

(c) what step should be taken to improve bond strength of reinforcement in concrete?

Answer:

strength of bond depends upon the friction between steel and concrete the bond strength increase with increase in copressive strength of concrete .

QUESTION NO 4:-

what is creep ? what are creep of factor affecting creep ? what is different between creep and strain rexliation ?

ANSWER:-

CREEP:

Creep is indicated when strain in a solid increases with time while the stress producing the strain is kept constant. In more practical terms, creep is the increased strain or deformation of a structural element under a constant load. Depending on the construction material, structural design, and service conditions, creep can result in significant displacements in a structure. Severe creep strains can result in serviceability problems, stress redistribution, prestress loss, and even failure of structural elements.

Factor affecting creep:

1. Aggregate
2. Mix Proportions
3. Age of concrete

The magnitude of creep strain is one to three times the value of the instantaneous elastic strain, it is proportional to cement-paste content and, thus, inversely proportional to aggregate volumetric content. The magnitude of creep is dependent upon the magnitude of the applied stress, the age and strength of the concrete, properties of aggregates and cementitious materials, amount of cement paste, size and shape of concrete specimen, volume to surface ratio, amount of steel reinforcement, curing conditions, and environmental conditions.

Different between creep strain rexlaition:

two terms are sometimes 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.

QUESTION NO 2:-

(A) :what will be expected loss in strength of 3000psi concrete if its curing is not been performd?

ANAWER:-

Hydration is not an instantaneous process. Water is required for hydration reaction to rchieve 100%.

If curing is not done, there is water deficiency which causes insufficient hydration. As a result there will be capillary pores which won,t be segmented, causing cracks and shrinkage in the lomg run.

Thus the concret if not cured resilts in poor strength development and lower durabikity and 3000 psi strength could be decreased upon 50 % .

(B :what is the percentage effiency of membrane curing as compared to water curing?

ANSWER:-

Results indicate that, using Membrane curing compounds, an efficiency of 80-90% can be

achieved as compared to Conventional water Curing

C: what step should to be taken to improve bond strength of reinforcement in concrete?

AnsWER:-

curing at high tempeture can be cause retrigression in **strength** which refer to high strength in early age due to heating but loss in strength at late age

QUESTION NO 1:-

(a) what is re tempering of concrete ?in which case retempring of cocncrete done?

AnsWER:-

When water is added to a stiffened concrete or partially set fresh concrete in order to bring it back to the desired consistency or workability, then it is called "retempering of concrete

Retempering is done owing to loss of workablity or undue stiffness of concrete at actual sidein case of long tunnels road construction etc.where batching plant is few kilometer away

(b) :what is the normal RPM of the agitator of atransit mixture ? what is the minimum limitation of total revolution of agitator in a trasit mixture set by ASTM before concrete placement?

AnsWER:-

FOR RPM :-

for agitating a range from 2 to 6 RPM is sufficent for mixing the concrete drum must trunfaster with mixmium of 12 to18 RPM .

FOR ASTM :-

_____transit mixer have capacity ranging from 4.7m speed of agitator varies from 2 to 5 RPM a limit of 300 revolution has been set by ASTM before placing.

QUESTION NO 5:-

what is the different between drying shrankige and plastic shrinkage ?is drying and plastic shrinkage reversible?

AnsWER:

Plastic Shrinkage

Loss of water from fresh concrete, which leads to plastic shrinkage, can occur in a couple of ways. The predominant mode is, however, through evaporation from an exposed surface. Concrete can also lose water through suction by the subbase or, depending on the type of material used in its manufacture, the formwork. Such loss of water can aggravate the effects of surface evaporation. It is

generally accepted that the loss of water from the paste fraction of concrete due to external factors generates negative capillary pressures that cause the volume of the paste to contract, hence the shrinkage

Drying Shrinkage:-

The loss of moisture from concrete after it hardens, and hence drying shrinkage, is inevitable unless the concrete is completely submerged in water or is in an environment with 100 percent relative humidity. Thus, drying shrinkage is a phenomenon that routinely occurs and merits careful consideration in the design and construction of concrete structures

Drying shrinkage is reversible through (40 to 70) in mostiure .

QUESTION NO 6:-

what are risk to concrete structure exposed to sea water ? how do you increase resistence of concrete to sea water?

AnsWER:-

Concrete exposed to seawater is wetted by a solution of saltsprincipally sodium chloride and magnesium sulfate. Damage to concrete, if it occu1·s, usually results from failure to use good practices in c0ncrete co11struction, and often is the result of freezing and thawing or wetting and drying, as much as or more than the results of the effects of seawater as such. Mag -

nesium sulfate may attack most, if not all, of the constituents of hardened portland cement paste, especially the aluminate constituent; chlorides may promote corrosion of steel; alkalies may participate in alkali-aggregate reaction. Thus, concrete exposed to seawater should be made with cement of controlled aluminate content and with nonreactive aggregate, embedded steel should be well covered by concrete of low permeability, and good construction practices should be followed

the effects of mixing and curing concrete with seawater on the compressive, tensile, flexural and bond strengths of concrete are investigated. Concrete mixes were prepared by varying coarse aggregates, cement proportions and types. Six groups of concrete mixes were mixed and cured in fresh water, six groups were mixed and cured in seawater, while four groups were mixed with fresh water and cured in seawater. The compressive strength and subsequently the other related strengths of concrete were shown to increase for specimens mixed and cured in seawater at early ages up to 14 days, while a definite decrease in the respective strengths was observed for ages more than 28 days and up to 90 days. The reduction in strength increases with an increase in exposure time, which may be due to salt crystallisation formation affecting the strength gain.

(b) Concrete is required for the internal columns of a building. The specified 28 days strength is

(x+y+15) MPa (where x and y are the last two digits of your Roll no.) The following equations may be used to find average compressive strength

$$f_m = f_{min} + 7 \quad \text{for } f_{min} < 21 \text{ MPa}$$

$$f_m = f_{min} + 8.5 \quad \text{OR} \quad f_{min} = 1.1 * f_{min} + 5 \quad \text{for } 21\text{MPa} < f_{min} < 35\text{MPa}$$

. The slump required is 50mm and a maximum size of 25mm is required. The fine aggregate has a Fineness modulus of 2.60. Preliminary tests indicate that FA and CA have a specific gravity of 2.65 and 2.7, with 1 percent absorption in C.A and 2% free moisture in F.A. The Bulk density of C.A is 1600 kg/m³. Find the required quantities of ingredients.

SOLUTION :-

GIVEN DATA :-

Slump = 50mm

Maximum size = 25mm

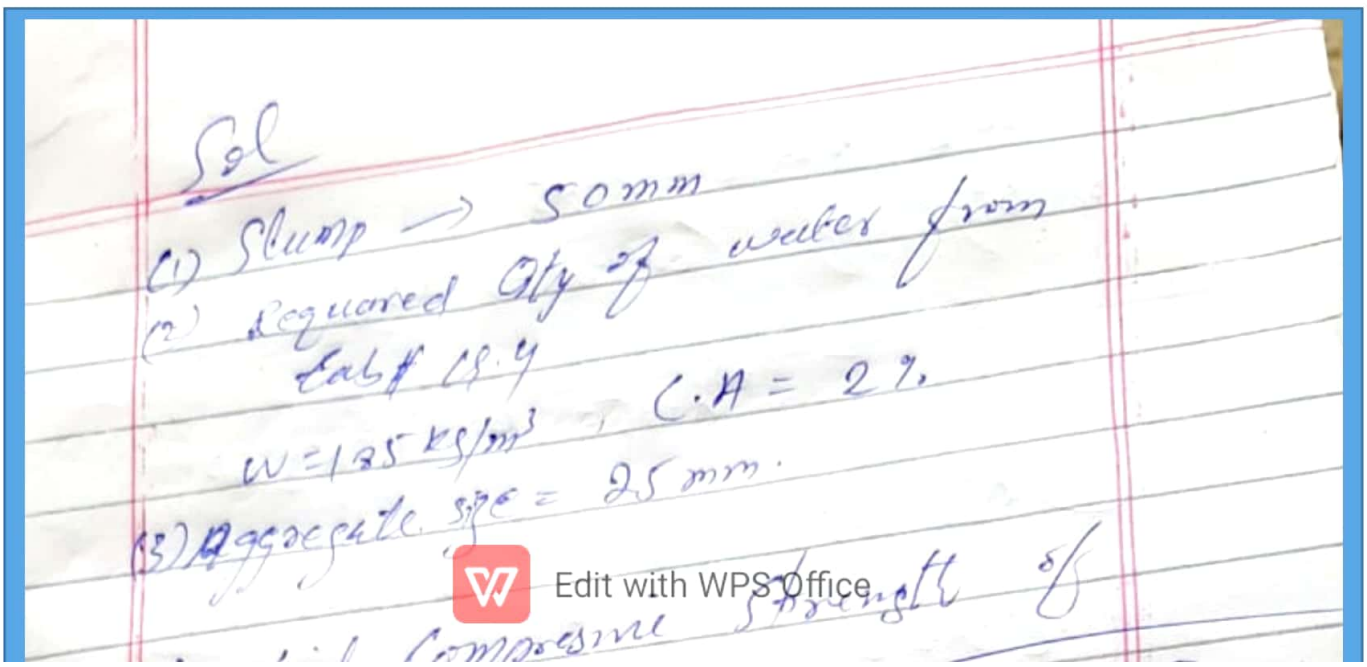
Fine agregad finness modulus= 2.60

Bulk density of C.A is = 1600 kg/m3

REQUIRED:-

Quantity of ingradients.

FORMULA + SOLUTION:-



w/c ratio = 0.45

(6) Qty of Cement => w/w/c ratio

= 185/0.45 = 411.11 kg/m³

(7) Qty of C.A from Tab# 19.8

C.A = 0.69

weight of ~~Cement~~ C.A = 0.69 × bulk of C.A

= 0.69 × 1600 = 1104 kg/m³

(8) Qty of F.A by volume method

weight of C.A =>

$$\Rightarrow 2.65\left(1000-\left(\frac{411.11}{3.15}+\frac{185}{1}+\frac{1104}{2.65}+20\right)\right)$$

$$=2.65(1000-(752.11)$$

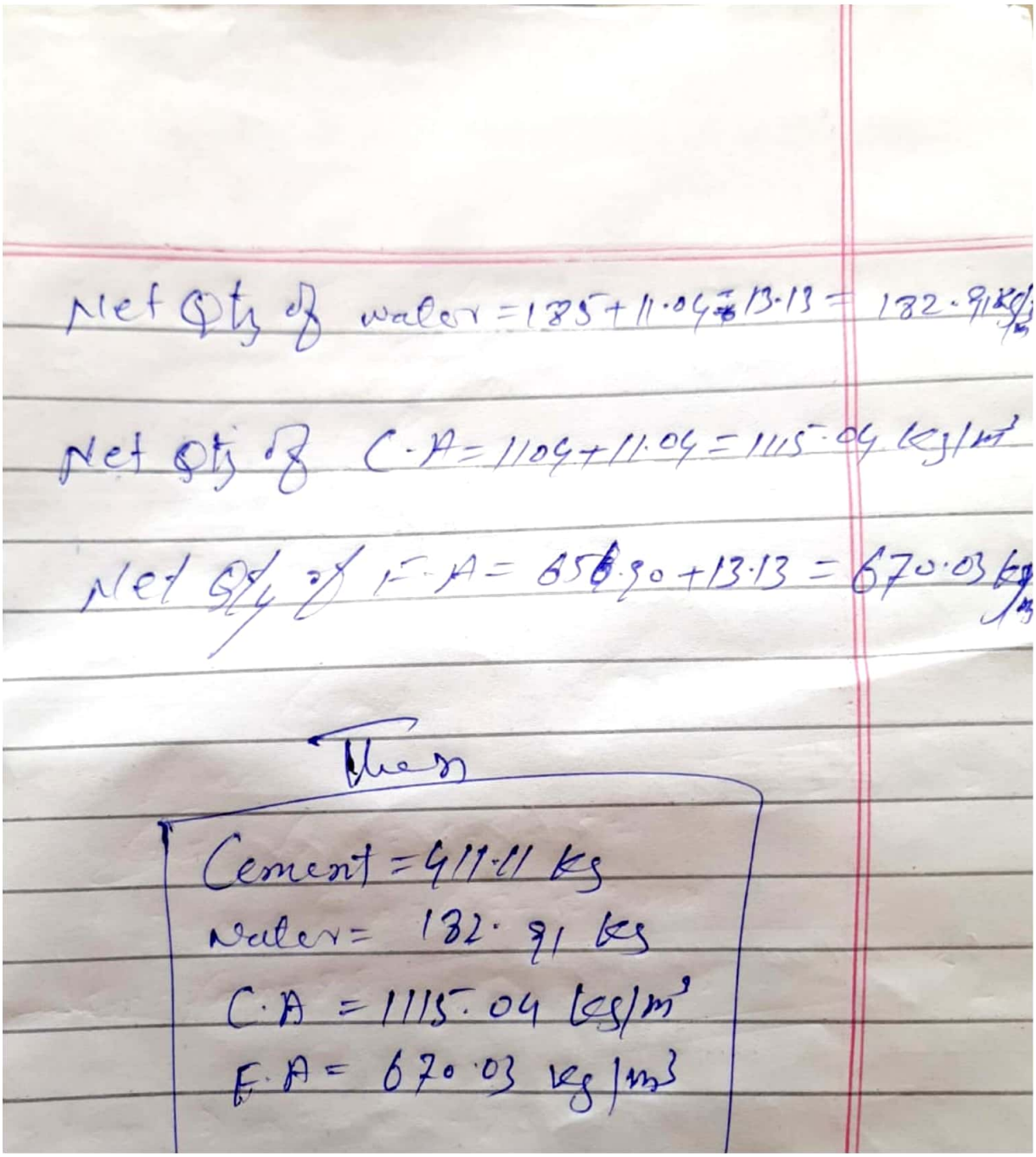
C.A = 656.80

for % of C.A =>

$\frac{1}{100} \times 1104 = 11.04$ kg/m³

2% for F.A =>

$= \frac{2}{100} \times 656.80 = 13.13$ kg/m³



ANSWER :=

cement = 411.11kg

water = 182.91kg

C.A = 1115.04 Kg/m3

F.A = 670.03 Kg/m3.

THE END.