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### SUBJECT : CONCRETE TECNALOGY

### DEPARTMENT : CIVIL ENGINEERING

### Assignment: Final term

### Section: A

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### QNO1: What is re-tempering of concrete? In which case re-tempering of concrete occur?

### ANS: Re-tempering of concrete:

### The process of remixing of water to concrete, in addition to required quantity of water is known as re-tempering of concrete. Sometimes, extra cement is also added while re-tempering.

### Re-tempering of concrete occur:

### Re-tempering is done owing to loss of workability or undue stiffness of concrete at actual side in case of long tunnels, road construction etc. where batching plant is few kilometers away.

### b) What is the normal rpm of the agitator of a transit mixer? What is the minimum limitation of the total revolution of agitator in transit mixer by ASTM before concrete placement?

### ANS: Mixer generally run it the speed of 15-20 revolution per minute. Normally 25-30 revolution are required for a well designed mixer to mixer to mix ingredients properly. Mixing time usually 1.5 to 2.5 minute and depend upon volumetric capacity of mixer. Batching plant takes 12 minutes to load a transit mixer of 6m^3 capacity.

### QNO2: What will be the expected loss in strength of 3000 psi concrete if it curing has not been performed at all?

### ANS: It will take longer than 28 days for the concrete cure and will be produce a weaker and easier to scare structure if it was not cured properly. When concrete is not cured properly, Its durability, strength and abrasive resistance are affected. When the surface of the concrete is not kept moist within the first 24 hour after the casting, the evaporation from the exposed horizontal surface result in plastic shrinkage cracks and a weak and dusty surface.

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### (b) What is percentage efficiency membrane curing as compared to water curing?

### ANS: Percentage efficiency:

### Membrane curing is 80% efficient as compared to water curing.

### (c): What is meant by retrogression of strength in concrete? Which method is used of curing promoted retrogression in concrete strength?

### Retrogression of concrete:

### Strength retrogression is defined as a change in the hydration product that are formed when cement exposed to high temperature (>110c/230f). It can be describe as a decline of cement strength at elevated temperature where decreased strength is observed with increasing time.

### Curing at high temperature can cause Retrogression in strength which refer to high strength in early age due to heating but loss in strength at later age.

### Concrete can attain28 days strength in 3 days by application heat.

### QNO3: What do you mean by endurance level? What is the endurance level of concrete and steel?

### ANS: Endurance (also related to sufferance resilience, constitution, fortitude, and hardiness) is the ability of an organism to exert itself and remain active for a long time, as well as its ability to resist withstand, recover from, and have immunity to trauma, wounds, or fatigue.

### STEEL: 0.5X strength.

### Concrete does not have minimum endurance level.

### (b) What is difference between attrition and erosion of concrete?

### ANS: Attrition:

### Sliding and scraping of concrete surface can cause erosion attrition.

### Erosion:

### Erosion is mechanical damage of concrete by water waves due to which sand and aggregate are washed away.

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

### Steps to improve the strength:

### Influence of the constitution material

### Degree of compaction

### Influence of curing.

### QNO4: What is creep? What are factor affecting creep? What difference between creep and strain relaxation?

ANS: **Creep:**

**The increase in strain of concrete with in passage of time under sustained stress is known as creep.**

* **All materials exhibit the phenomenon of creep, but in concrete its considerably more.**
* **The deformation of material under design stress is termed elastic and the subsequent increase in deformation under sustained design stress in creep.**
* **If a loaded concrete specimen is retrained in such a way that strain over time remains constant, creep will manifest itself in the form of progressive decrease in stress over time. This is term as relaxation.**

### Creep is not a completely reversible phenomenon.

### Factor affecting of 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 temperature 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 experiences less creep as compared to Ordinary Portland Cement.**

### Difference between creep and stress relaxation:

### Creep relaxation:

### Creep is an increase in plastic strain under constant stress

### Creep is an increased tendency towards more strain and plastic deformation with no change in stress

### Stress relaxation:

### Stress relaxation is a decrease in stress under constant strain

### This is primarily due to keeping the structure in a strained condition for some finite interval of times and hence causing some amount of plastic strain.

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### QNO5:What is the difference between drying shrinkage and plastic shrinkage? Is drying and plastic shrinkage are reversible?

### Difference between drying shrinkage and plastic shrinkage:

### Plastic shrinkage:

### Shrinkage which take place before concrete has set

### Occur during the first few hours after fresh concrete is placed

### During this period, moisture may evaporates faster from the concrete surface than it is replaced by bleed water and lower layers of the concrete mass.

### Drying shrinkage:

### The shrinkage that appear after the setting and hardening of concrete mixture due to loss of capillary water is know as drying shrinkage.

### Draying shrinkage occur in the first few months.

### Draying shrinkage decrease with the passage of time.

### Is drying and plastic shrinkage are reversible:

### 30% Shrinkage are reversible.

### QNO6: What are risk to concrete structure exposed to sea water? How do you increase resistance of concrete to sea water?

### ANS: Risk of concrete:

### It increase the risk of corrosion embedded reinforced steel, if the structure are not exposed to air in service. The most damaging effect of sea water on concrete arises from the action of chlorides on the steel reinforcement and the built up of salt.

### Sea water has sulphate that attack and promote cracks.

### Formation of silica jel by water and alkali of seawater cause cracks.

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### Increase resistance of concrete:

### That adding loam to a concrete mix and increase the compressive strength of the concrete under normal condition and enhance the performance of hardened concrete to resist the aggressive mediums of salty sea water

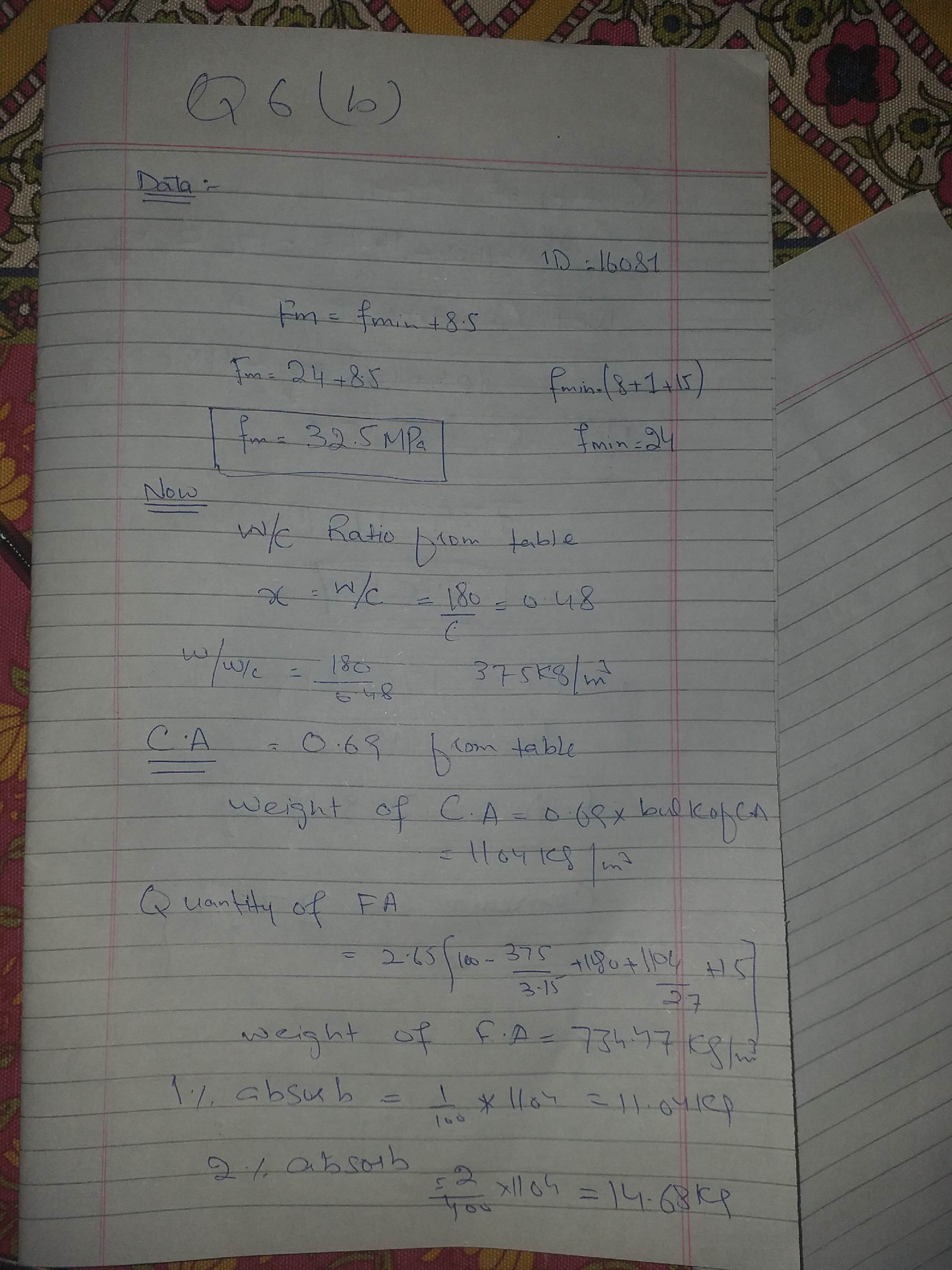
### By using sulphate resistant cement

### Avoiding the use of reactive aggregate

### Using coating at exterior surface of concrete to make it water tight

### QNO6: (b)

### ANS (b)



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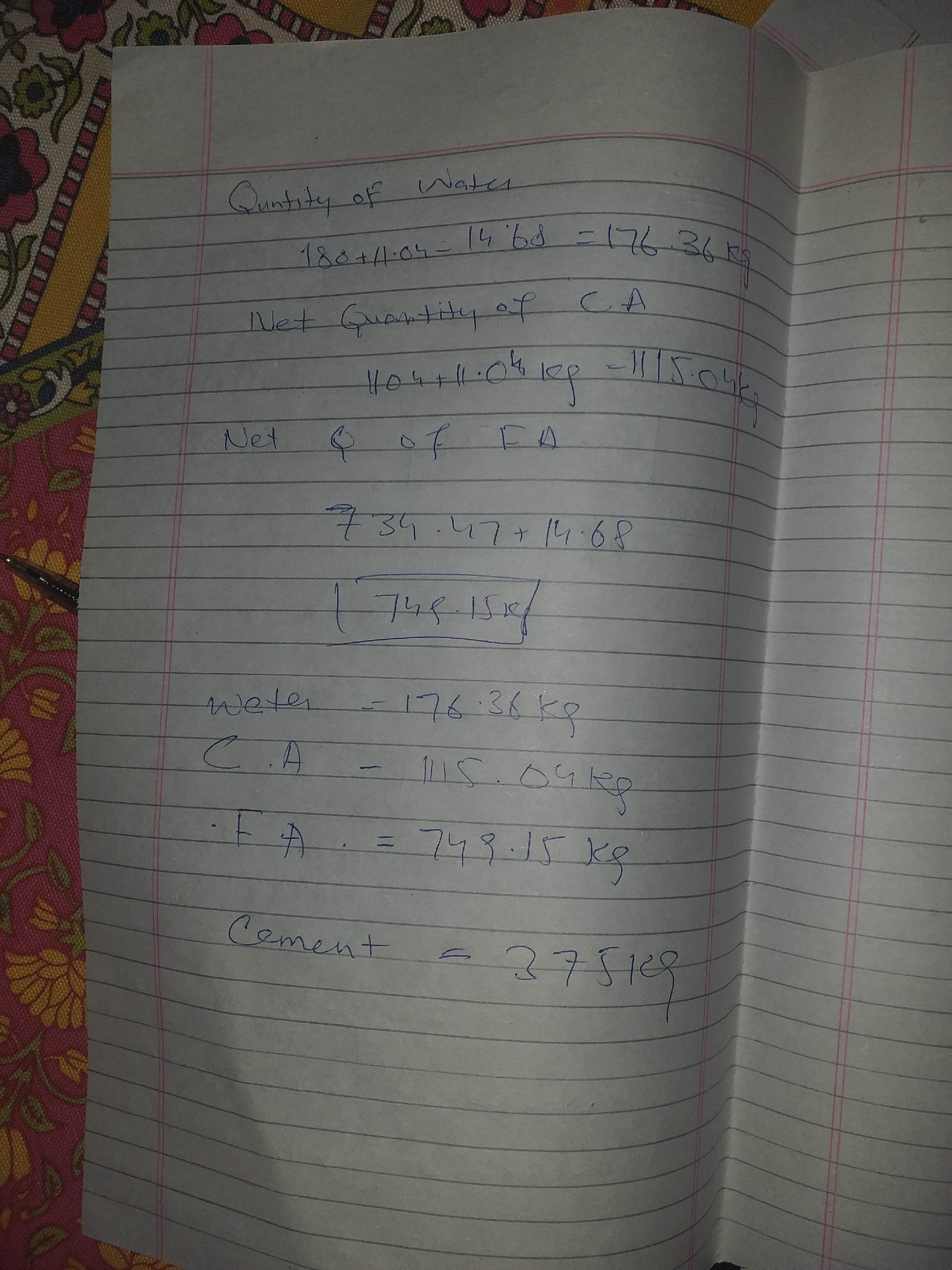
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