Perfect — I'll create a **Mixed Question Set of 40 questions**, containing:

✔ Allegation questions
✔ Algebra-based mixture questions
✔ Replacement formula questions
✔ Weighted average questions
✔ Concept-based reasoning (evaporation / leakage / fortification)
✔ Percentage decrease / concentration change questions
✔ Multi-step mixture questions
✔ Identification type (you must tell "allegation or not")

This will cover EVERYTHING you need for OICL + all other banking/insurance exams.

**Important:**
I will **only give the 40 questions now** (no answers).
You will solve them.
Then you will send me your answers.
I will check each one, explain where you went wrong, and guide your method.

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# 🔥 MIXED QUESTION SET (40 QUESTIONS)

*(Includes ALL patterns you must master)*
Try them one by one or all at once.

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## SECTION A — Pure Allegation (Very Easy → Easy)

### Q1.

Milk costing ₹30/L is mixed with milk costing ₹50/L.
Mixture costs ₹40/L.
Find ratio.

### Q2.

Sugar solution 20% is mixed with 50% solution to make 35% solution.
Find ratio.

### Q3.

Tea of ₹100/kg and ₹150/kg is mixed to make tea of ₹120/kg.
Find mixing ratio.

### Q4.

Pure milk (100%) is mixed with water (0%) to get 80% milk.
Find ratio of milk:water.

### Q5

A shopkeeper mixes rice costing ₹60 and ₹90 to earn 20% profit on mixture.
If SP = ₹96/kg, find ratio in which he mixed them.
*(Apply allegation only on CP.)*

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## SECTION B — Allegation (Moderate)

### Q6

30% alcohol solution + 70% alcohol solution → mixture 45%.
Find ratio.

### Q7

A solution contains 40% acid. How much 20% solution must be mixed to make 30% solution?

### Q8

A man mixes ghee of ₹300 and ₹450 to sell mixture at ₹420 with 20% profit.
Find mixing ratio.
*(First find CP, then apply allegation.)*

### Q9

Two types of oil are ₹80 and ₹120.
He wants to earn 25% profit by selling mixture at ₹120/kg.
Find ratio of mixing.

### Q10

A 90% pure gold is mixed with 75% pure gold to get 84% purity.
Find ratio.

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# SECTION C — Weighted Average Questions (Non-Allegation)

### Q11

20 kg of 30% sugar solution is mixed with 10 kg of 60% solution.
Find final %.

### Q12

15 L of 40% alcohol is mixed with 25 L of 20% alcohol.
Find final concentration.

### Q13

Two batches of wheat are 40 kg and 60 kg, costing ₹20/kg and ₹30/kg.
Find final cost per kg.

### Q14

10 L of milk (80% pure) is mixed with 30 L (50% pure).
Find purity of 40 L mixture.

### Q15

A class has 30 students with avg score 60, and 20 students avg 80.
Find combined average.

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# SECTION D — Algebra-Based Mixture (Non-Allegation)

### Q16

A 40 L mixture has milk & water.
If 10 L milk is added, milk becomes 75%.
Find original milk-water.

### Q17

A 30 L 20% salt solution becomes 30% when some water is evaporated.
Find amount of water evaporated.

### Q18

A mixture has 30% water.
If 10 L water is added, water becomes 40%.
Find original quantity.

### Q19

A 25 L 40% alcohol becomes 50% after some water evaporates.
Find evaporation.

### Q20

A milk–water mixture has 25% water. After adding 6 L water, water becomes 40%.
Find original quantity.

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# SECTION E — Replacement Formula (Remove & Refill)

### Q21

A vessel has 60 L milk.
Every time 10 L is removed and replaced with water.
Do this 2 times.
Find final milk.

### Q22

A 40 L solution has pure milk.
8 L is replaced with water 3 times.
Find remaining milk.

### Q23

A container has 50 L 30% alcohol.
10 L is replaced with water twice.
Find final % alcohol.

### Q24

70 L milk has some water.
10 L mixture removed & replaced with water two times.
Final milk = 49. Find initial milk.

**Q25**

A chemical solution has 80 L.
20 L replaced with water once.
Find concentration if original was 90%.

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# SECTION F — Concept-Based Reasoning (Evaporation, Leakage, Fortification)

**Q26**

20 L 40% acid → evaporated water → becomes 50% acid.
Find final volume.

**Q27**

30 L 30% salt becomes 24 L after evaporation.
Find new concentration.

**Q28**

A tank loses 10% water due to leakage. After adding 15 L water, it becomes full at 100 L.
Find original quantity.

**Q29**

Pure milk added to 60 L 40% milk to make 50% mixture.
Find added milk.

**Q30**

Water added to 30 L 90% acid to make 75% acid.
Find amount of water added.

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# SECTION G — 3-Component Mixtures (No allegation)

**Q31**

Mix 3 solutions:
10 L of 20%, 20 L of 40%, 30 L of 50%.
Find final %.

### Q32

Rice of ₹50/kg, ₹60/kg, ₹70/kg in ratio 2 : 3 : 5.
Find final cost.

### Q33

Milk with 100%, 80%, 60% purity mixed in ratio 1 : 1 : 1.
Find final purity.

### Q34

Soldiers' groups have avg age 26, 28, 30 with numbers 40, 30, 30.
Find overall avg.

### Q35

Copper alloy: 10 kg at 20% copper, 15 kg at 40%, 25 kg at 50%.
Find final %.

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# SECTION H — Identify Type (You must tell "allegation or not")

### Q36

A shopkeeper mixes oil @ ₹120 & ₹160 to get ₹144 mixture.
Approach?

### Q37

A 40 L mixture has 25% water.
5 L water is added and becomes 30% water.
Approach?

### Q38

A vessel has 80 L 40% acid.
20 L is removed and replaced with water.
Approach?

### Q39

A solution has 30% acid. After evaporation it becomes 40%.
Approach?

### Q40

Three types of sugar costing ₹20, ₹30, ₹40 mixed in ratio 1:2:1.
Approach?

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# ⭐ Your Task

1. Solve as many as you want — all 40 or section by section.
2. Send me your answers (even rough).
3. I will **check each one**, explain **where you went wrong**, and correct your method.
4. I will also tell you **whether you applied the right concept or not**.

Tell me when you're ready to start solving.

Absolutely! Let's make a **clear and complete differentiation** between **Allegation** and **Weighted Average** in a **tabular form** with definitions, key points, formulas, and examples.

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| Feature | Allegation | Weighted Average |
|---|---|---|
| **Definition** | Allegation is a rule used to **find the ratio in which two or more ingredients of different qualities/costs/concentrations are mixed** to get a desired quality or mean value. | Weighted Average is used to **find the average value of a quantity when different items have different weights, quantities, or contributions**. |
| **Purpose** | To find the **ratio of mixing**. | To find the **average value** after mixing different quantities. |
| **When to Use** | When the **mean value is between the two quantities** (the "alligation condition"). Usually applied for **cost, price, percentage, concentration, purity**. | When you want the **final average value** after combining items with different weights/quantities. No restriction on values; mean can be **inside or outside the range**. |

| | | |
|---|---|---|
| **Formula / Rule** | $\text{Ratio of quantities} = \frac{\text{Value of stronger - Mean}}{\text{Mean - Value of weaker}}$ | $\text{Weighted average} = \frac{\sum (\text{Quantity} \times \text{Value})}{\sum \text{Quantity}}$ |
| **Key Concept** | Focuses on **ratio**, not absolute quantities. | Focuses on **actual contribution** of each item. |
| **Condition** | Mean value must lie **between the two given values**. | No restriction; can apply to any set of values. |
| **Result** | Gives **ratio of quantities to be mixed**. | Gives **final value (average)** after mixing. |
| **Example 1** | Mix milk costing Rs. 30/kg and Rs. 50/kg to get Rs. 40/kg: Ratio = (50−40):(40−30) = 10:10 = 1:1 | Mix 40 kg of wheat at Rs. 20/kg and 60 kg at Rs. 30/kg: Weighted average = (40×20 + 60×30)/(40+60) = Rs. 26/kg |
| **Example 2** | Mix 20% sugar solution and 50% solution to get 35%: Ratio = (50−35):(35−20) = 15:15 = 1:1 | Mix 50 L of 40% alcohol with 25 L of 20% alcohol: Final concentration = (50×40 + 25×20)/(50+25) = 33.33% |

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## Quick Comparison in Words

1. **Allegation** → "I want this mean quality, how much of each ingredient should I mix?" → Output = ratio.

2. **Weighted Average** → "I have quantities and their values, what is the final average?" → Output = mean value.

3. Allegation **does not need actual quantities**, only ratio. Weighted Average **needs actual quantities**.

4. Allegation **requires mean between extremes**. Weighted Average has **no such restriction**.

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If you want, I can **make a small flowchart/diagram** showing **when to use Allegation vs Weighted Average** for mixture questions — it will be extremely easy to remember.

Do you want me to do that?