📘 Class 9 Maths – Ganita Manjari

📊 Chapter 10: How Quantities Combine: Understanding Data

✏️ Exercise Set 10.2 – Question 1 & Solution

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1. 📊 Savitri's Annual Score

Question:

Savitri's marks in Kashmiri are as follows: 35 out of 50 in internal tests, 44 out of 60 in the project, and 80 out of 100 in the final exam. The annual percentage score is calculated by combining the internals, project, and final exam in the ratio 3 : 4 : 5. Which of the following expression(s) gives her annual score (as a percentage) in Kashmiri?

(i)

$(35 \times 3 + 44 \times 4 + 80 \times 5) \div (3 + 4 + 5)$

(ii)

$[(35/100) \times 3 + (44/100) \times 4 + (80/100) \times 5] \div (3 + 4 + 5)$

(iii)

$\{[(35/50) \times 3 + (44/60) \times 4 + (80/100) \times 5] \div (3 + 4 + 5)\} \times 100$

(iv)

$\{[(35/50 \times 100) \times 3 + (44/60 \times 100) \times 4 + (80/100 \times 100) \times 5] \div (3 + 4 + 5)\}$

💡 Solution

The three scores are out of **different maximum marks**:

- Internal tests: 35 out of 50
- Project: 44 out of 60
- Final exam: 80 out of 100

Therefore, we must first convert each score into a **percentage** or a proportion of its maximum marks.

(i) ❌

Expression:

(35 × 3 + 44 × 4 + 80 × 5) ÷ (3 + 4 + 5)

This directly uses **35, 44 and 80** as the scores.

However, these marks are out of different totals: **50, 60 and 100**.

Therefore, the scores cannot be directly combined in this way.

❌ **So, (i) is not correct.**

(ii) ❌

Expression:

[(35/100) × 3 + (44/100) × 4 + (80/100) × 5] ÷ (3 + 4 + 5)

This treats all three scores as if they were marks **out of 100**.

But:

- 35 is out of 50
- 44 is out of 60
- 80 is out of 100

Therefore, this expression is not correct.

❌ **So, (ii) is not correct.**

(iii) ✅

Expression:

{[(35/50) × 3 + (44/60) × 4 + (80/100) × 5] ÷ (3 + 4 + 5)} × 100

Here, each score is first converted into a proportion of its maximum marks.

Then the weighted average is calculated using the ratio **3 : 4 : 5**.

Finally, multiplying by 100 converts the result into a percentage.

✅ **So, (iii) is correct.**

(iv) ✅

Expression:

{[(35/50 × 100) × 3 + (44/60 × 100) × 4 + (80/100 × 100) × 5] ÷ (3 + 4 + 5)}

Here, each score is first converted into a **percentage**:

35/50 × 100

44/60 × 100

80/100 × 100

Then the weighted average is calculated using the ratio **3 : 4 : 5**.

This is equivalent to expression **(iii)**.

✅ **So, (iv) is correct.**

📌 Final Answer

The correct expression(s) are: (iii) and (iv).