Unit 7 · Simple Interest

HARDER PRACTICE QUESTIONS · ANSWER KEY

Full marks 28

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Doubling

ANSWER A · 3

i. In 8 years the interest equals the principal: $R = \frac{100 \times I}{P \times T} = \frac{100}{8} = \mathbf{12.5\%}$.

ii. The interest must be twice the principal: $T = \frac{100 \times 2}{12.5} = \mathbf{16\ years}$.

iii. $I = \frac{7500 \times 5 \times 12.5}{100} = \text{Rs } 4{,}687.50$, so $A = \mathbf{Rs\ 12{,}187.50}$.

MARKING SCHEME

- ✓ 12.5%.
- ✓ 16 years.
- ✓ Rs 12,187.50.

2 Split in two

ANSWER HA · 4

Let x be the part at 6%. The other part is $50000 - x$.

$\frac{6x}{100} + \frac{8(50000 - x)}{100} = 3400$, so $6x + 400000 - 8x = 340000$.

$2x = 60000$ and $x = 30000$.

Rs 30,000 at 6% and Rs 20,000 at 8%. (Check: $1800 + 1600 = 3400$. ✓)

MARKING SCHEME

- ✓ The two parts written as x and $50000 - x$.
- ✓ The equation for the interest.
- ✓ $x = 30000$.
- ✓ Rs 30,000 and Rs 20,000.

3 The wrong entry

ANSWER HA · 3

Simple interest adds the same block each year. From year 1 to year 2 the block is Rs 400, and from year 2 to year 4 it is Rs 800 in two years, Rs 400 a year. So **year 3 is wrong**: it should be **Rs 6,200**.

Principal: $5400 - 400 = \mathbf{Rs\ 5{,}000}$. Rate: $\frac{400}{5000} \times 100\% = \mathbf{8\%}$.

MARKING SCHEME

- ✓ The amount grows by the same Rs 400 each year.
- ✓ Year 3 is wrong, and should be Rs 6,200.
- ✓ Rs 5,000 at 8%.

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4 Spot the error

ANSWER U · 3

Interest of Rs 19,440 in under a year is nearly as much as the principal, but 9% a year is only Rs 2,160 in a whole year.

He put $T = 9$, but T must be in **years**: 9 months is $\frac{9}{12} = \frac{3}{4}$ of a year.

$I = \frac{24000 \times 3 \times 9}{4 \times 100} =$ **Rs 1,620**.

MARKING SCHEME

- ✓ A whole year's interest is only Rs 2,160, so his answer is far too big.
- ✓ The mistake: T must be in years, $\frac{3}{4}$.
- ✓ Rs 1,620.

5 Which loan?

ANSWER A · 4

i. Bank A: $\frac{500000 \times 1.5 \times 12}{100} =$ **Rs 90,000**.

Cooperative: $\frac{500000 \times 1.5 \times 11}{100} =$ Rs 82,500, and the charge is Rs 5,000: **Rs 87,500**.

ii. **The cooperative, by Rs 2,500.**

iii. The bank charges 1% a year more, and the cooperative's charge is 1% once, so they are equal after **1 year**.

MARKING SCHEME

- ✓ Bank A Rs 90,000.
- ✓ Cooperative Rs 87,500.
- ✓ The cooperative, by Rs 2,500.
- ✓ 1 year.

6 After the tax

ANSWER A · 3

What she received is 95% of the interest, so the interest was $3800 \div 0.95 =$ Rs 4,000.

$P = \frac{100 \times I}{T \times R} = \frac{100 \times 4000}{2 \times 8} =$ **Rs 25,000**.

MARKING SCHEME

- ✓ 95% of the interest is Rs 3,800.
- ✓ The interest is Rs 4,000.
- ✓ Rs 25,000.

7 In a real setting

ANSWER A · 3

Time: 2.5 years. Interest received: $\frac{250000 \times 2.5 \times 11}{100} =$ Rs 68,750. Interest paid: $\frac{250000 \times 2.5 \times 8}{100} =$ Rs 50,000.

Gain: **Rs 18,750**.

Percent: $\frac{18750}{68750} \times 100\% = \frac{3}{11} \times 100\% \approx$ **27.3%**.

MARKING SCHEME

- ✓ Rs 68,750 and Rs 50,000.
- ✓ Rs 18,750.
- ✓ About 27.3%.

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8 Think

ANSWER HA · 3

i. **Same.** $T \times R$ is 40 either way.

ii. **Same.** $P \times R$ is unchanged: one factor is doubled and another halved.

iii. **Not the same.** $T \times R$ becomes 4 times as big, so the interest does too.

MARKING SCHEME

✓ i. Same.

✓ ii. Same.

✓ iii. Four times as much.

9 Make your own

ANSWER HA · 2

For example, Rs 10,000 at 8%, or Rs 20,000 at 4%: $\frac{10000 \times 1.5 \times 8}{100} = 1200$.

$P \times R \times 1.5 \div 100 = 1200$, so $P \times R$ must always be **80,000**.

MARKING SCHEME

✓ Two pairs that give Rs 1,200.

✓ $P \times R = 80000$.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	0	3	13	12	**28**

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