SpeedLabs

MATHS

ICSE 8th

TEEVRA EDUTECH PVT. LTD.

SIMPLE INTEREST AND COMPOUND INTEREST

1. Find the simple interest on Rs.8600 from 18th October, 2006 to 13th march, 2007 at 8% per annum. Also find the amount.

Ans. $P = Rs.\ 8600$

$R = 8\%$

$T = 18\ Oct.\ to\ 13\ March$

$= (13 + 30 + 31 + 31 + 28 + 13)\ days$

$= (13 + 30 + 31 + 31 + 28 + 13)\ day$

$= 146\ days = \frac{146}{365}\text{ years}$

$$S.I = \frac{P \times R \times T}{100}$$

$$= Rs.\ \frac{8600 \times 8 \times \frac{146}{365}}{100}$$

$= Rs.\ 275.20$

$Amount = P + S.I. = Rs.\ 8600 + 275.2$

$= Rs.\ 8875.2$

2. Ashish lent Rs.10500 to Mark at 7% per annum simple interest. After 5 years, Mark discharged the debt by giving a watch and Rs.3000 in cash. What is the value of the watch?

Ans. $P = Rs.\ 10500, R = 7\%, T = 5\ year$

$$S.I = \frac{P \times R \times T}{100}$$

$$= \frac{10500 \times 7 \times 5}{100}$$

$= Rs.\ 3675$

$Amount = P + S.$

$= Rs.\ 10500 + 3675$

$= Rs.\ 14175$

$The\ value\ of\ watch = Amount - Rs.\ 13000$

$= Rs.\ 14175 - 13000$

$= Rs.\ 1175$

3. In what time will the simple interest on Rs.7560 be Rs.1102 at $6\frac{1}{2}\%$ per annum?

Ans. $P = Rs.\ 7560, S.I. = 1102.5\ \mathrm{R} = 6\frac{1}{2}\% = \frac{25}{4}\%$

We are requires to compute time in years.

$$\mathrm{S.I.} = \frac{\mathrm{P} \times \mathrm{R} \times \mathrm{T}}{100}$$

OR

$$\mathrm{T} = \frac{\mathrm{S.I} \times 100}{\mathrm{P} \times \mathrm{R}}$$

$$= \frac{1102.5 \times 100}{7560 \times \frac{25}{4}}$$

$= 2.3$ years.

$= 2$ years 4 month

4. In how much time will Rs.25600 amount to Rs.35665, when money is worth $9\frac{1}{4}\%$ per annum simple interest?

Ans. $Amount = Rs.\ 35664, P = Rs.\ 25600$

$S.I.\ Amount - P$

$= Rs.\ (35664 - 25600)$

$= Rs.\ 10064$

$$\mathrm{R} = 9\frac{1}{4}\% = \frac{37}{4}\%$$

$$\mathrm{S.I} = \frac{\mathrm{P} \times \mathrm{R} \times \mathrm{T}}{100}$$

$$\mathrm{T} = \frac{\mathrm{S.I} \times 100}{\mathrm{P} \times \mathrm{R}}$$

$$= \frac{10064 \times 100}{25600 \times \frac{37}{4}}$$

$= 4.25$ years

or 4 years 3 months

5. At what rate per cent per annum will Rs.1625 amount to Rs.2080 in $3\frac{1}{2}$ years?

Ans. $\mathrm{p} = \mathrm{Rs.}\ 1625, \mathrm{Amount} = \mathrm{Rs.}2080, \mathrm{T} = 3\frac{1}{2}\ \mathrm{years} = \frac{7}{2}\ \mathrm{years}$

We have to computer rate of int etrest R

$$S.I = \frac{P \times R \times T}{100}$$

$$R = \frac{S.I.100}{P \times T} \ldots\ldots\ldots\ldots (1)$$

$$S.I = Amount - P$$

$$= Rs.(2080 - 1625)$$

$$= Rs.\ 455$$

Substituting rhe value of S.I .P & T in Equal (1) we get

$$R = \frac{455 \times 100}{1625 \times \frac{7}{2}} = 8\%$$

6. A sum of money becomes $\frac{8}{5}$ of itself in 5 years at certain rate of simple interest. Find the rate of interest.

Ans. *Let* $P = Rs.\ x$, *Amount* $= Rs.\frac{8}{5}x$

Time $T = 5$ *years*

We have to compute rate of interest R.

$$S.I. = Rs.\left(\frac{8}{5}x - x\right)$$

$$= \frac{3}{5}x$$

$$= S.I. = \frac{P \times R \times T}{100}$$

$$R = \frac{S.I. \times 100}{P \times T}$$

$$= \frac{\frac{3}{5}x \times 100}{x \times 5}$$

$$= \frac{300}{25} = 12\%\ p.a$$

7. The simple interest on a certain sum for 3 years at 8% per annum is Rs.96 more than the simple interest on the same sum for 2 years at 9% per annum. Find the sum.

Ans. $S.I.(i)$ for a sum P, for; $T = 3$years, $R = 8\%$ p.a

$$S.I.(1) = \frac{P \times 8 \times 3}{100} \ldots\ldots\ldots (i)$$

$S.I.\ (2)\ for\ a\ sum\ P, for, T = 2years, R = 9\%\ p.a.$

$$S.I.\ (2) = \frac{P \times 9 \times 2}{100} .....(ii)$$

$$S.I.\ (1) = S.I.\ (2) + 96$$

$$\frac{P \times 24}{100} = \frac{p \times 18}{100} \times 96$$

OR

$$p\left(\frac{P \times 24}{100} - \frac{p \times 18}{100}\right) = 96$$

OR

$$p \times \frac{6}{100} = 96$$

OR

$$p = \frac{96 \times 100}{6} = Rs.1600$$

The sum $Rs.1600$

8. Find the amount and the compound interest on Rs. 5000 for 2 years at 8% per annum, compounded annually.

Ans. Principal for the first year = Rs. 5000

Interest for the first year $= Rs.\left(\frac{8}{100}\right) \times 5000 = 400$

Principal for the second year =Rs.5400

Amount at the end of second year $= Rs.\left(1 + \frac{8}{100}\right) \times 5000 = Rs.5832$

Interest for the second year $= \frac{8}{100} = 432\ Rs.$

Compound interest = 400+432=832 Rs.

9. Find the amount and the compound interest on Rs. 8000 for 2 years at 6% per annum, compounded annually.

Ans. Principal for the first year = Rs.8000

Interest for the first year $= \frac{6}{100} \times 8000 = 480\ Rs.$

Principal for second year = 8000+480=8480 Rs.

Interest for second year $= \frac{6}{100} \times 8480 = 508.80\ Rs.$

Principal at the end of second year

$= 8480 + 508.80 = 8988.80$ Rs.

Total compound interest = 480+508.80=988.80 Rs.

10. Find the amount and the compound interest on Rs. 2500 for 2 years, compounded annually, the rate of interest being 6% during the first year and 8% during second year.

Ans. Principal for the first year = Rs.2500

Interest earned by end of first year = $\frac{6}{100} \times 2500 = 150$ Rs

Principal for the second year = 2500+150=2650 Rs.

Interest earned for second year = $\frac{8}{100} \times 2650 = 212$ Rs

Total interest = 150+212=362 Rs.

Amount at the end of the second year

= 2650+212=2862 Rs.

11. Find the amount and the compound interest on Rs. 2500 for 3 years at 6% per annum, compounded annually.

Ans. Principal for the first year = Rs.25000

Interest for first year = $\frac{6}{100} \times 25000 = 1500$ Rs.

Principal for 2nd year = Rs.25000+1500=26500 Rs.

Interest for 2nd year = $\frac{6}{100} \times 26500 = 1590$ Rs

Principal for 3rd year = 26500+1590=28090 Rs.

Interest for 3rd year = $\frac{6}{100} \times 28090 = 1685.40$ Rs.

Amount at the end of the 3rd year

=28090+1685.4 =29775.4 Rs.

12. Find the amount and the compound interest on Rs. 10000 for 3 years at 10 % per annum, compounded annually.

Ans. Principal for the 1st year = Rs.10000

Interest for 1st year = $\frac{10}{100} \times 10000 = 1000$ Rs

Principal for 2nd year = 10000+100=11000 Rs.

Interest for 2nd year = $\frac{10}{100} \times 11000 = 1100$ Rs

Principal for 3rd year = 11000+1100=12100 Rs.

Interest for 3rd year $= \frac{10}{100} \times 121000 = 1210$ Rs.

Amount at the end of the 3rd year

$= 12100 + 1210 = 13310$ Rs.

Total compounded interest $= 1000 + 1100 + 1210 = 3210$ Rs.

13. 'A' took a loan of Rs. 25000 from corporate bank at 12% per annum, compounded annually. How much amount he will have to pay at the end of 3 years?

Ans. Principal for the 1st year Rs.25000

Interest for the 1st year $= \frac{12}{100} \times 25000 = 3000$ Rs

Principal for 2nd year = Rs.28000

Interest on 2nd the year $= \frac{12}{100} \times 28000 = 3360$ Rs.

Principal for the 3rd year = 31600 Rs.

Interest for the 3rd year $= \frac{12}{100} \times 31360 = 3763.2$ Rs.

Amount at the end of 3rd year = 35123.20 Rs.

Total compounded interest = Rs.10152

14. 'A' deposited Rs. 15625 in a bank at 8% per annum, compounded annually. How much amount will he get after 3 years?

Ans. Principal for 1st year = Rs.15625

Interest for 1st year $= \frac{8}{100} \times 15625 = 1250$ Rs.

Principal for 2nd year = Rs.16875

Interest for 2nd year $= \frac{8}{100} \times 16875 = 1350$ Rs.

Principal for the 3rd year = Rs.18225

Interest for the 3rd year $= \frac{8}{100} \times 18225 = 1458$ Rs.

Amount at the end of the 3rd year = Rs.19683

15. A person lent out Rs. 16000 on simple interest and the same sum on compound interest for 2 years at 12.5% per annum. Find the ratio of the amounts received by him as interest after 2 years.

Ans. Simple Interest

Principal for the 1st year = Rs.16000

Interest for the 1st year $= \frac{12.5}{100} \times 16000 = 2000$ Rs.

Interest for 2nd year

Total interest = Rs.4000

Compound Interest

Principal for 1st year = Rs.16000

Interest at the end of the 1st year $= \frac{12.5}{100} \times 16000 = 2000$ Rs.

Principal for 2nd year

Interest at the end of the 2nd year $= \frac{12.5}{100} \times 18000 = 2250$ Rs.

Total compound interest = 2000 + 2250 = 4250 Rs.

Ratio of the interest = 4000 : 4250 or 16:17