S.I(Simple Interest) & CI(Compound Interest)

- P=principle,R=rate, T=time

- S.I (Simple Interest)=PRT/100
- Amount for S.I, Amount=S.I +P
- C.I(Compound Interest) for 't' year=P{(1+R/100)^t-1}
- Amount for C.I, Amount=C.I+P or P(1+R/100)^t

- **The formula for Compound Amount**
- **P [1+ R/100]^t [When money is compounded annually]**
  = P [1+ R/(2*100)]^{2t} [When money is compounded half-yearly]
  = P [1+ R/(12*100)]^{12t} [When money is compounded monthly]

(A) Compound interest is calculated on the Amount (Principal + Interest).

(B) If we have CI at the rate of a% for the 1st time interval & at the rate of b% for the 2nd time interval, then the net effective rate of interest after 2 intervals = $\boldsymbol{a+b+\frac{ab}{100}}$ (Time intervals are equal)

(C) If a sum of money P amounts to A_1 in T time at CI & the same sum of money amounts to A_2 in 2T time at CI, then $\frac{P}{A_1}=\frac{A_1}{A_2}$

(D) If a sum of money P amounts to A_1 after T years at CI & the same sum of money amounts to A_2 after (T+1) years at CI, then the rate of interest = $\frac{A_2-A_1}{A_1}\times \mathbf{100}$

(E) If a sum of money becomes x times in T years at CI, then it will be x^n times in nT years at CI.

(F) Simple Interest (SI) is calculated on Principal. Simple Interest = $\frac{PRT}{100}$

(G) Difference between Simple Interest & Compound Interest for 2 years = $\frac{PR^2}{100^2}$

(H) Difference between Simple Interest & Compound Interest for 3 years= $\frac{PR^2(300+R)}{100^3}$

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Questions 1: Find the amount for CI if Rs 20000 is invested at 10% p.a. for 3 years.

Solution: Using the formula: $A= P [1+ R/100]^t$

$A = 20000 [1 + (10/100)]^3$

On Solving, we get A = Rs. 26620

Question 2: The CI on a sum of Rs 625 in 2 years is Rs 51. Find the rate of interest.

Solution: We know that A = CI + P

A = 625 + 51 = 676

Now going by the formula: $A = P [1+(R/100)]^t$

$676 = 625 [1+(R/100)]^2$

$676/625 = [1+(R/100)]^2$

We can see that 676 is the square of 26 and 625 is the square of 25

Therefore, $(26/25)^2 = [1+(R/100)]^2$

$26/25 = [1+(R/100)]$

$26/25 - 1 = R/100$

On solving, R = 4%

Question3: A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:

Sol. S.I. for 1 year = Rs. (854 - 815) = Rs. 39.

S.I. for 3 years = Rs.(39 x 3) = Rs. 117.

$\therefore$ Principal = Rs. (815 - 117) = Rs. 698.

Question 4 :A sum fetched a total simple interest of Rs. 4016.25 at the rate of 9 p.c.p.a. in 5 years. What is the sum?

Solution: Principal $= \text{Rs.} \left(\frac{100 \times 4016.25}{9 \times 5}\right)$

$= \text{Rs.} \left(\frac{401625}{45}\right)$

= Rs. 8925.

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