Assignment 5

Chapter No.6

Profit & Loss , Simple & Compound Interest

1. Shan bought 30 liters of milk at the rate of Rs.8 per liter. He got it churned after spending Rs.10 and 5kg of cream and 30 liter of toned milk were obtained. If he sold the cream at Rs.30 per kg and toned milk at Rs.4 per liter, his profit in the transaction is:

A) 10% **B) 9%** **C) 8%** **D) 7%**

CP =Rs.(30 x 8 + 10) = Rs.250
SP = Rs. (30 x 5 + 30 x 4) = Rs.270
Gain% = (20/250 x 100)% = 8%

2. A trader wants to sell a watch at 25% profit. If its cost price was Rs.x more, an extra profit of Rs.50 would be made on it. Find x(in Rs.)

A) 100 **B) 125** **C) 150** **D) 200**

Let the intial CP be 100 then SP is 125 with 25% profit.
Now to get a profit of 50Rs. more, profit= 50+25=75
So profit of 25% =75
Then let the new CP be y.
y*25%=75
y=300
According to question 100+x=300
→x=200

3. The Selling price of 12 articles equals the cost price of 15 articles. find the profit/loss percentage?

A) 25% profit **B) 20% profit** **C) 25% loss** **D) 20% loss**

SP of 12 = Cost price of 15.
Loss = 15 – 12 = 3
Loss% = (3*100)/12 = 25%

4. Vijay marked his camera at 50% above his cost price. He sold it after allowing discount and still made a profit of 20%. What is the discount percentage he offered on it?

A) 20% **B) 25%** **C) 30%** **D) 35%**

Let the CP be 100
Marked Price = 50% of 100+ 100 = 150
Profit he made = 20%

(SP-CP)/CP*100 = 20
→ SP = 120
Discount offered = 150-120 = 30
Discount% = 30/150*100 = 20%

5. Francis and George started a business with investments of Rs.7000 and Rs.10000. After x months, Francis left. After two more months David joined the business with an investment of Rs.10000. If the annual profit is shared among David, Francis and George in the ratio 10:7:24, find the respective time periods of David, Francis and George for which they stayed that year.

A) 5:5:12 **B) 1:1:3** **C) 1:1:4** **D) 1:1:2**

Investment ratio of Francis and George = 7 : 10
Investment ratio of David and George = 1 : 1
Profit ratio of David and George = 1 : 1
Here, David = 10x
Francis = 7x
George = 24x
Here, with investment of 10,000, George's profit is 2x/month
So, with investment of 10,000, David's profit is 10x, so he would be stayed for 5 month.
Now, Francis got 7x profit with investment of 7000.
If, 10,000 = 2x
7000 = ?
(7000 x 2x)/10000 = 1.4x /month
1.4x → 1month
7x → ? months
∴ 7/1.4 = 5months
Now, ratio of staying in month = 5 : 5 : 12

6. Ram and Shyam started a business with investments of Rs.40000 and Rs.60000. At the end of one year, out of the total Ram got Rs.2000 less profit than Shyam. Find the total profit (in Rs.)

A) 12000 **B) 10000** **C) 8000** **D) 16000**

Solution:

$$\frac{Ram}{shyam} = \frac{4}{6}$$

Guess total profit = 10x
Here 6x – 4x =2000
2x = 2000
X = 1000
Total profit = 10 * 1000 = 10,000

7. Arun and Bharat started a business with investments of Rs.10000 and Rs.15000 respectively. Arun being a working partner gets Rs.100 every month as salary from the profit. At the end of one year the business makes a profit of Rs.4800. Find the total share of Arun out of this amount (in Rs.)

A) 2880 B) 26400 C) 3240 D) 2760

Arun/Bharat = 2/3

Annual profit = Arun's profit + Bharat's profit + Arun's Salary

$\therefore$ 2x + 3x + 12(100) = 4800

$\therefore$ 5x = 4800 – 1200

$\therefore$ 5x = 3600

$\therefore$ x = 720

Arun's profit = 2x + 1200

= 720 X 2 + 1200

= 2640

8. Arun sold two napkins at same price.He earned 10% profit on one napkin and suffered 10% loss on the other, what was his overall profit/loss percentage?

A) No profit B) 1% profit C) 1% loss D) None of these

Let us assume that the sale price for each item was 100

- Item 1
  Profit % = (sp-cp)/CP *100
  10 = (100-x)/X*100
  x = 10000/110 = 90.90909
  Cost of item 1 = 90.90
- Item 2
  Loss% = (CP-SP)/CP*100
  10 =(X-100)/X*100
  x = 111.1111
  Cost of Item 2 = 111.11
- Total Cost = 90.90 +111.11 =202.02
- Total Sales = 100+100 = 200
- Net Loss = 2.02
- Loss% = (2.02/200)*100
  = 1.01% ~ 1%

9. The sale price of an article including the sale tax is Rs. 616. The rate of sale tax is 10%. If the shopkeeper has made a profit of 12%, the cost price of the article is

A) 500 B) 600 C) 515 D) 575

Let C.P. be Rs x

∴ S.P. = x+12% of x
= 112x/100 = 28x/25
28x/25 +10% of 28x/25 =616
⇒ x = Rs 500

10. When a article is sold for Rs.3400, there is a loss of 2%. What is the cost price of the commodity?
A) Rs 3500.50 B) Rs 3200 C) Rs 3400.56 D) Rs 3469.34
Loss = 2% so,
98%……3400
100%……..x
x = (3400×100)/98 = 3469.34

11. A certain sum is invested for T years. It amounts to Rs. 400 at 10% per annum. But when invested at 4% per annum, it amounts to Rs. 200. Find the time (T)?
A) 39 years B) 45 years C) 41 years D) 50 years
Time (T) = (A1-A2) ×100÷A2R1−A1R2
= [400−200]×100÷[200×10−400×4]
= 20000/400 = 50 years.

12. A sum of Rs. 800 amounts to Rs. 920 in 3 years at simple interest. If the interest rate is increased by 3%, it would amount to how much?
A) 780 B) 992 C) 848 D) 700
Principal = Rs.800, Amount = Rs.920, T = 3years
Simple interest = 920−800 = 120
∴ Rate % = 120×100/800×3 = 5%
If rate % is increased by 3%, i.e., rate % = 8%, then
SI = 800×3×8/100 = 192
∴ Amount = Rs.800+Rs.192 = Rs.992

13. If simple interest on a certain sum of money for 4 years at 5% per annum is same as the simple interest on Rs. 560 for 10 years at the rate of 4% per annum then the sum of money is:
A) 1180 B) 1120 C) 1200 D) 1250

14. Nishu invested an amount of Rs. 13,900 divided in two different schemes A and B at the simple interest rate of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years be Rs. 3508, what was the amount invested in Scheme B?
A) 6400 B) 6500 C) 7200 D) 7500

- Let the investment in scheme A be Rs.x and the investment in scheme B be Rs.(13900−x)
- We know that SI = P×R×T/100
- Simple Interest for Rs.x in 2 years at 14% p.a = x×14×2/100 = 28x/100
- Simple Interest for Rs.(13900−x) in 2 years at 11% p.a.
  = (13900−x)×11×2/100
  = 22(13900−x)/100
- Total interest=Rs.3508
  ⇒ 28x/100 + 22(13900−x)/100 = 3508
  ⇒28x+305800−22x = 350800
  ⇒6x = 45000
  ⇒x = 45000/6
  ⇒x = 7500
- Investment in Scheme B = 13900−7500 = 6400Rs

15. The difference between the simple interest received from two different sources on Rs. 1500 for 3 years is Rs. 13.50. The difference between their rate of interest is:

A) 0.20% **B) 0.30%** **C) 0.50%** **D) 0.80%**

Let r1 and r2 be the required rate of interest.
Then
⇒ 13.50= 1500*3*r1/100-1500*3*r2/100
⇒ r1-r2=135/450
⇒ r1-r2=0.3

16. What will be the ratio of simple interest earned by certain amount at the same rate for 4 years and 12years?

A) 1:4 **B) 1:2** **C) 3:1** **D) 1:3**

Let the principal for both the case be Rs. P and the rate of interest be R% p.a.
Required ratio = P×R×4 /100 : P×R×12 / 100 = 1:3.

17. Sankar borrowed some money at the rate of 4% pa for the first 4 years, 6% for the next 3 years and 7% for the next 10 years. If the total interest paid by him is Rs.8528,how much money did he borrow?

A) 7200 **B) 8200** **C) 8328** **D) None of these**

Let Wasim borrowed Rs.x
⇒x*4*4/100 + x*6*3/100 + x*7*10/100
=8528
⇒16x/100+18x/100+70x/100 = 8528

⇒104x/100 = 8528
⇒x/100 = 82
∴ x = Rs.8200

18. A sum of money trebles itself in 16 years. In how many years it would become double itself in how many years?
A) 4 B) 5 C) 8 D) 8.5
Principal=x, SI=2x, T=16yrs
Rate= (2x*100)/(x*16) = 12.5%
Now for double
SI=x, R=12.5%, P=x
Time=(x*100)/(x*12.5) = 8yrs

19. If the annual rate of simple interest increases from 10% to 12(1/2)%,annual income increases by 2500 then the principal(Rs)
A) 1,02,500 B) 1,25,000 C) 10,000 D) 1,00,000
Change in SI = 25/2 - 10 = 5/2%
∴% 2.5 of principal = ₹ 2500
Principal = (SI × 100) /(R × T)
∴ Principal = (2500 × 100) /(2.5 × 1)
= ₹ 100000

20.Babu takes a loan Rs.2000 at 5% simple interest. He returns Rs.1000 at the end of 1 year. How much amount should he pay to clear the due in 2 years.
A) 1000 B) 1150 C) 2150 D) None of these
Amount left to be paid
= 1000+ 2000 x 5 /100 + 2000 x 5/100
= 1150

21. The Simple interest on a certain sum for 2 years at 10% per annum is Rs. 90. The corresponding compound interest is:
A) 97 B) 90 C) 94.50 D) 100
Principle = (100 x interest) / (time x rate)
⇒ Principle = (100 x 90) / (2 x 10) = Rs. 450
C.I. = [450 x (1 + 10/100)2 - 450] = Rs. 94.50

22. If the difference between the simple interest and compound interests on some principal amount at 20% for 3 years is Rs. 48, then the principal amount is
A) 636 B) 650 C) 375 D) 400
Given, T = 3yrs Rate. Interest = 20% Principal = x

∴S.I = (x∗T∗R)/100

⟹S.I = x∗3∗20/100
⟹S.I = 3x5
⟹Amount on SI = x + 3x/5 = 8x/5
∴Amount on C.I = x∗(1+Rate/100)^T
⟹Amount on C.I = x∗(1+20/100)^3
⟹Amount on C.I = x∗(6/5)^3
⟹Amount on C.I = 216x/125
Amount on C.I – Amount on S.I = C.I−S.I
⟹216x/125 − 8x/5 = 48
⟹(216x − 200x)/125 = 48
⟹x = 375

23. Divide Rs. 3903 between A and B, so that A's Share at the end of 7 years may equal to B's share at the end of 9 years, compound interest being at 4 percent.
A) 2018 and 1885 **B) 2028 and 1875**
C) 2008 and 1895 **D) 2038 and 1865**
A's present share = x
B's present share = 3903-x
We have x*(1+4/100)^7 = (3903-x)* (1 + 4/100)^9
∴ x/(3903-x) = (1+4/100)^2 = (26/25)^2 = 676/625
Dividing Rs. 3903 in the ratio of 676 : 625
∴ A's present share = 676/(676 + 625) of Rs .3903 = Rs. 2028
B's present share = Rs. 3903 - Rs. 2028 = Rs. 1875

24. If a sum on compound interest becomes three times in 4 years, then with the same interest rate, the sum will become 27 times in:
A) 8 years **B) 12 years** **C) 24 years** **D) 36 years**
Amount =Principal (1+r/100)^t
P(1+r/100)^4 = 3P
⇒(1+r/100)^4 = 3
P(1+r/100)^n = 27P
⇒ (1+r/100)^n = 3^3
⇒ (1+r/100)^n = [(1+r/100)^4]^3
⇒ n=4 X 3 = 12
25. In what time will Rs. 64,000 amount to Rs.68921 at 5% per annum interest being compounded half yearly?
A) 3 years **B) 2 years** **C) 2(1/2) years** **D) 1(1/2) years**
CA = P(1+r/100)^{2t}
69821 = 64000(1+5/100)^{2t}

$69821/64000 = (4041)^{2t}$
$(4041)^3 = (4041)^{2t}$
$3 = 2t$
$t = 3/2$
Hence The required time is 1.5 Years.

26. If the difference between the CI and SI on a sum of money at 5% per annum for 2years is Rs.16.Find the Simple Interest ?
A) 180 B) 460 C) 520 D) 640

CI-SI = 96
$\Longrightarrow$ [P x $(1+r/100)^2$-P] – (P x r x 2 / 100) =16
$\Longrightarrow 41P/400 - P/10 = 16$
$\Longrightarrow P = 6400$
Therefore SI $= 6400 \times 5 \times 2/100 = 640$

27. The difference between CI and SI on an amount Rs. 15000 for 2 year is Rs.96. What is the rate of interest per annum ?
A) 12 B) 10 C) 8 D) 7

CI-SI = 96
$\Longrightarrow$ [15000 x $(1+r/100)^2$-15000] – (15000 x r x 2 / 100) =96
$\Longrightarrow 15000[(100+r^2) -1 - 2r/100] = 96$
$\Longrightarrow r^2 = 96 \times 2/3 = 64$
$\Longrightarrow r = 8\%$

28. Rohit borrowed Rs. 1200 at 12% PA .He repaid Rs. 500 at the end of 1 year. What is the amount required to pay at the end of 2nd year to discharge his loan which was calculated in CI
A) 945.28 B) 1106.00 C) 1107.55 D) 1100.65

CI at the end of 1st year
= 1200 * (1+(12 /100)) = 1344
CI = 1344-1200 = 144
500 paid then remaining amount = 1344 – 500
= 844
At the end of 2nd year
844*[(1+(12/100)] =945.28

29. A sum of money invested at CI to Rs.800 in 3 years and to Rs.840 in 4 years. Find rate of interest PA ?
A) 6% B) 5% C) 4% D) 2%

Simple interest for one year=840−800=40Rs.

Rate of interest = (40*100)/800 = 5%

30. The effective annual rate of interest corresponding to the nominal rate of 4% per annum payable half yearly is

A) 4% **B) 4.4%** **C) 4.04%** **D) 4.2%**

Amount of Rs. 100 for 1 year when compounded half-yearly}

$=\text{Rs. } [100 \times (1 + 2 / 100)^2] = \text{Rs. } 104.04$

$\therefore$ Effective rate = $(104.04-100)\% = 4.04\%$