# UNIT 2
# CHAPTER 1
# PERCENTAGE
# BASIC CONCEPT BUILDER

What is percentage?

In mathematics, a **percentage** is a number or ratio expressed as a fraction of 100. It is often denoted using the percent sign, "%", or the abbreviations "pct.", "pct"; sometimes the abbreviation "pc" is also used.[1] A percentage is a dimensionless number (pure number).

For example:

1- If a goalie saves 96 out of 100 shots, his save *percentage* is 96 percent.

2- If you score 60 marks Information technology does that mean you score 60%. The answer is NO. Why? Because you don't know the base. Percentage is basically a game of base. If you don't know the base than you can't calculate the percentage.

**Percentage and Fraction values**

We list the reciprocals of all natural numbers from 1 to 12, simultaneously with their multiples.
Reciprocal **of 2** (i.e 1/2) is 50%, that **of 4** will be half of 50% i.e 25%.
Similarly, reciprocal **of 8** will be half of 25% = 12.5% and that of 16 will be 6.25%

Reciprocal **of 3** is 33.33%. Thus reciprocal **of 6** will be half of 33.33% i.e 16.66%
and that **of 12** will be 8.33%

Reciprocal **of 9** is 11.11% and reciprocal **of 11** is 9.0909%. Reciprocal **of 9** is composed of 11's and reciprocal **of 11** is composed of 09's. If any calculation has 9 in the denominator, the decimal part will be only 1111 or 2222 or 3333 or 4444... ex. 95/9 will be 10.5555
Reciprocal **of 20** is 5% ; Reciprocal **of 21** is 4.76% and **of 19** is 5.26%.
Thus we can easily remember reciprocals of 19, 20, 21 as 5.25%, 5 , 4.75% i.e 0.25% more and less than 5%
Similarly, reciprocal **of 25** is 4 % Reciprocal **of 24** is 4.16% and **of 26** is 3.84%.
Thus, we can easily remember reciprocals of 24, 25, 26 as 4.15%, 4, 3.85% i.e 0.15% more and less than 4%.
Reciprocal **of 29** is 3.45% (i.e 345 in order) and reciprocal **of 23** is 4.35% (same digits but order is different. If 1/29 = 3.45% than definitely 1/23 will be more than 3.45%. Reverse the digits and the answer comes to 4.35%)
Reciprocal **of 18** is half of 11.1111% i.e 5.5555% i.e it consists of only 5's. Reciprocal **of 22** is half of 09.0909%. i.e 4.5454% i.e consists of 45's.
One can remember 1/8 = 12.5% and tables of 8, and one can easily remember fractions
such as 2/8, 3/8, 5/8, 7/8 which are used very regularly.

1/8 is 12.5%, 2/8 is 25% (12.5*2), 3/8 is 37.5% (12.5*3), 5/8 is 62.5% ( 12.5*5),
7/8 = 87.5% Ex: 37.5% of 880 = 3/8 × 880 = 330

**Shortcut to Calculating Percentages**

**We use the approximation techniques to calculate percentage values**

A. how to calculate the value of 11% of 1264

Here, the concept of 10% and 1%. i.e, for any value, say 1264, 10% of the value is obtained by simply shifting the decimal point by one place (or digit) to the left. $\therefore$ 10% of 1264.0 = 126.40

(i.e. the decimal point moves to the left by one place (or digit)). Similarly, 1% of 1264.0 will be obtained by shifting the decimal point by two places to the left. Hence, 1% of 1264.0 = 12.640.

Again 36% of 1325 = (40% – 4%) of 1325 = (4 × 10% – 4 × 1%) of 1325

= (4 × 132.5 – 4 × 13.25) = 530 – 53 = 477.

B. Similarly consider another example, say, 18% of 3250 = (20% – 2%) of 3250

= (2 × 10% – 2 × 1%) of 3250 = (2 × 325 – 2 × 32.5) = 585.

Hence if there is a 10% increase then the new value will become 1.1 times the old value and in general if there is an increase of p%, the new value will become 1.p times the old value. Here we should know, when to use this concept and when not to use i.e. if there is an increase of 33.33% then the new value will become 4/3 times the old value. Calculating in this way i.e. converting $33^1/_3$ into a fraction and simplifying is faster.

Whenever percentage increase cannot easily be converted into a convenient fraction, then the approximate percentage increase p, in integer form, must be found and then 1.p has to be used. The same logic holds for percentage decrease.

**Change of base**

**We explain this concept with a simple examples given below**

- ✓ If A is 20% more than B, by what percent is B less than A? Do the same problem if A was 37.5% more than B. Why it is important to work with fraction equivalents to save time & calculations.

Hence If A is r % more than B , then B is $\frac{100r}{100+r}$ % less than B. Again if A is r % less than B, then B is $\frac{100r}{100-r}$ % more than A.

**Successive Percent changes**

**If A's salary increase by 10% in the next year and 20 % in the next to next year, then what is the net percentage increase. ( Change it)**

- ✓ The net increase of (a%) and a (b%) change is equivalent to (a + b + ab/100%) change. Probably the last example can be more easily solved with multiplying factors. Thus one can use Multiplying factors or a + b + ab/100 interchangeably.

- ✓ Successive percentage change is also useful in any relation of the type C = A * B. If there is a (a%) change in A and a (b%) change in B, then C changes by (a + b + ab/100%). This has also applications in Data Interpretation. Thus if market share grows by 20% and even if the total market size declines by 10%, the sales grows by 1.2 * 0.9 = 1.08 i.e. 8% as Sales = Market size * Market Share.

- ✓ The same relation appears many times in geometry. Thus if any quadrilateral has all its sides increasing by 10%, the area increases by 21% as area is proportional to square of linear dimensions. If sides of a cuboid increase by 20%, volume increases by 72.8% and surface area increases by 44%.

**EXAMPLES:**

**Example 1:** The sum of 18% of a number and 6% of the same number is 492. What is 12% of that number?

Sol: Sum of 18% and 6% = 18% + 6% = 24%

24%=492 ; 12% = 492 * 12% / 24%=246

**Example 2:** In an examination it is required to get 65% of the aggregate marks to pass. A student gets 522 marks and is declared failed by 7% marks. What are the maximum aggregate marks a student can get?

Sol: Pass marks of the examination = 65%

Student failed by 7%, so marks secured by student = 65% – 7% = 58%

58%=522; 100% =900

**Example 3:** In a test, minimum passing percentage for girls and boys is 30% and 45% respectively. A boy scored 280 marks and failed by 80 marks. How many more marks did a girl require to pass in the test if she scored 108 marks?

Sol: Boy gets 280 marks and fails by 80 marks = 280 + 80 = 360;

45 % = 360 therefore 30 % = 240; so girls got 108 marks and fails by 240 – 108 = 112 marks

**Example 4:** When 30% of one number is subtracted from another number, the second number reduces to its own four-fifth. What is the ratio between the first and the second numbers respectively?

Sol: Let x and y be the two numbers then

$y - 30\% x = 4/5 y$ ; $y - 4/5 y = 30\% x$

$y /5 = 30 x/100 \Rightarrow x:y = 2:3$

**Example 5:** In a school there are 800 students out of whom 45 per cent are girls. Monthly fee of each boy is 600 and monthly fee of each girl is 30 per cent less than each boy. What is the total monthly fee of girls and boys together?

Sol: Number of girls = 45 / 100 * 800 = 360

Number of boys = 800 – 360 = 440

Monthly fee of each boy = 600

Monthly fee of each girl = 420

Total fee of boys and girls = 360 × 420 + 440 × 600

= 151200 + 26400

= 415200

**Example 6:** Ajay spends 25 per cent of his salary on house rent, 5 per cent on food, 15 per cent on travel, 10 per cent on clothes and the remaining amount of ` 27,000 is saved. What is Ajay's income?

Sol: Ajay's total income be 100%

His total expenditure = 25% + 5% + 15% + 10% = 55%

Savings = 100% – 55% = 45%

45% = 27,000 therefore 100% = 27000 * 100/45 = 60,000

**Example 7:** When the price of eggs is reduced by 20%, it enables a man to buy 20 more eggs for 40. What is the reduced price per egg ?

Sol: Saving due to reduction =20/ 100 * 40 =8

So the sum of Rs 8 enables the man to purchase 20 more eggs at the reduced price (R.P); Reduced price per egg => 8/ 20 =0.4 = 40 paise

**Example 8:** The price of sugar is increased by 25%. If a family wants to keep its expenses on sugar unaltered, then the family will have to reduce the consumption of sugar by?

Sol: Initial price be 100 and consumption be 100 kg

Total expense = 100 × 100 = 10,000

New price = 100 + 25 = 125

But new expenditure = 10,000
New consumption = 10,000/125 = 80
So consumption of sugar reduced by 100 – 80 = 20%

**Example 9:** The population of a town increased by 10%, 20% and then decreased by 30%. The new population is what % of the original?

Sol: The overall effect =1.1×1.2×0.7 (Since 10%, 20% increase and 30% decrease)=0.924=92.4%.

**Example 10:** Two successive discounts of 10% and 20% are equal to a single discount of?

Sol: Discount is same as decrease of price. So, decrease =0.9×0.8=0.72⇒28% decrease (Since only 72% is remaining)

**Example 11:** A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had?

Sol: Suppose originally he had x apples.
Then, (100 - 40)% of x = 420. ; 60/100 * x = 420; x =420 * 100/60 = 700.

**Example 12:** In a group of students, 70% can speak English and 65% can speak Hindi. If 27% of the students can speak none of the two languages, then what per cent of the group can speak both the languages?

Sol: 27% students speak neither of the languages.

Number of students speaking either of the languages = 100% – 22% = 73% n(E U H) = 73%

n(E) = 70% n(H) = 65% n(E∩H) = ?

But n(EUH) = n(E) + n(H) – n(E∩H) 73 = 70 + 65 – n(E∩H)

n(E∩H) = 135 – 73 = 62

# UNIT 2
## CHAPTER 2
## PROFIT & LOSS
## BASIC CONCEPT BUILDER

We introduce the concept with some definitions below. This concept is basically an application of percentage.

**Cost price** (CP) is the price at which an article is purchased. **Selling price** (SP) is the price at which an article is sold.

If SP is more than CP, it is a **profit** or **gain**

If CP is more than SP, it is a **loss**.

- **Gain or Profit** = SP – CP
- **Loss** = CP – SP
- Loss or gain is always reckoned on CP
- **Profit Percentage** (Profit %) = $\frac{PROFIT}{CP} \times 100 = \frac{SP-CP}{CP} \times 100$
- **Loss percentage** (Loss %) = $\frac{LOSS}{CP} \times 100 = \frac{CP-SP}{CP} \times 100$
    - Profit or Gain % = SP = $CP \times \frac{(100+PROFIT\,\%)}{100}$ ; CP = $SP \times \frac{100}{(100+PROFIT\,\%)}$
- **LOSS %** = SP = $CP \times \frac{(100-LOSS\,\%)}{100}$ CP= $SP \times \frac{100}{(100-LOSS\,\%)}$

Hence

- If an article is sold at a profit of 25%, then SP = 125 % of CP
- If an article is sold at a loss of 25% then SP = 75% of CP

**SOME IMPORTANT FACTS**

- If a person sells two items at the same price; one at Profit or Loss of A% and another Profit or loss of B%, then **Net Percent** Change = A + B + $\frac{A \times B}{100}$
    - If Profit %, take positive value and if Loss % take negative value. If the final result is positive, that is Profit % and if final result is negative, that is loss%

- If a trader professes to sell his goods at cost price, but uses **false weights**, then Gain % = $\frac{Error}{True\ value - Error} \times 100$

- If an article is sold after allowing a certain discount (d%) on **marked price** (M.P.) then the **selling price** (S.P.) is given by S.P. = (100 – d)% × M.P.

- If an article is sold after allowing two **successive discounts** of $d_1$% and $d_2$% then selling price (S.P) is given by SP = $\frac{100-d1}{100} \times \frac{100-d2}{100} \times M.P$

- Two **successive discounts** of $d_1$ and $d_2$ are equivalent to a single discount of
  - $d_1 + d_2 - \frac{d_1 \times d_2}{100}$

**Examples**

**Example 1:** A man buys a cycle for Rs.1400 and sells it at a loss of 15%. What is the selling price of the cycle?

Sol: CP = Rs 1400 Loss = 15%

SP = $1400 \times \frac{85}{100}$ = Rs. 1190

**Example 2:** When a commodity is sold for Rs.34.80, there is a loss of 2%. What is the cost price of the commodity?

Sol: SP = Rs. 34.80, Loss = 2%

CP = $34.80 \times \frac{100}{98}$ =Rs.35.51

**Example 3:** Shyam purchased 20 dozens of toys at the rate of Rs. 375 per dozen. He sold each one of them at the rate of Rs. 33. What was his percentage profit?

Sol: CP of 1 dozen Toys = Rs.375 ; SP of 1 dozen Toys =12□33 = 396 Profit = 396 - 375 = 21

Profit % = $\frac{21}{375} \times 100$= 5.6

**Example 4:** A shopkeeper sells 200 meters of cloth for Rs. 9,000 at a profit of Rs. 5 per meter. What is the cost price of 1 meter of cloth?

Sol: Profit on 200 meter of cloth = 200 × 5 = Rs 1,000

Cost price of 200 meter of cloth = 9000 – 1000 = Rs 8000

Cost price of 1 meter of cloth = $\frac{8000}{200}$ = Rs.40

**Example 5:** On selling 17 balls at Rs. 720, there is a loss equal to the cost price of 5 balls. Then find the cost Price?

Sol: (C.P.of 17 balls) – (S.P. of 17 balls) = (C.P. of 5 balls)

C.P. of 12 balls = S.P. of 17 balls = Rs.720.

CP of 1 ball= Rs. $\frac{720}{12}$ = Rs.60

**Example 6:** An article was purchased for Rs. 78,350/-. Its price was marked up by 30%. It was sold at a discount of 20% on the marked up price. What was the profit percent on the cost price?

Sol: Cost Price = Rs.78,350

Marked price = $78350 \times \frac{130}{100}$ = Rs.101855

Selling Price = $101855 \times \frac{80}{100}$ = Rs.81484

Profit = 81484 – 78350 = 3134

Profit % = $\frac{3134}{78350} \times 100$ = 4%

**Example 7:** The cost of 8 kg of almonds is equal to the cost of 50 kg of apples. The cost of 19 kg of mangoes is Rs. 456. The cost of 1 kg of apples is twice the cost of 2 kg of mangoes. What is the total cost of 3 kg of almonds and 4 kg of apples together?

Sol: Cost price of 1 kg of Mangoes $\frac{456}{19}$ = Rs 24

Cost Price of 1 kg apples = 2 × 48 = Rs. 96

Cost Price of 1 kg almond $\frac{50 \times 96}{8}$ = Rs 600

Cost price of 3 kg of almond and 4 kg of apples = 3 × 600 + 4 × 96 = Rs. 2184

**Example 8:** John buys an old scooter for Rs. 4700 and spends Rs. 800 on its repairs. If he sells the scooter for Rs. 5800. What is his profit percent?

Sol: Cost Price = 4700+800 = Rs.5500. Selling Price = Rs. 5800.

Profit= (SP) - (CP)=5800 - 5500 = Rs. 300.

Profit% = $\frac{300}{500} \times 100 = 5\frac{5}{11}\%$

**Example 9:** Raju purchased an item of Rs. 46,000 and sold it at loss of 12 percent. With that amount he purchased another item and sold it at a gain of 12 percent. What was his overall gain/loss?

Sol: CP = Rs. 46,000 Loss = 12%

SP = $46,000 \times \frac{88}{100}$ = 40480

Second Time

CP = Rs 40480, Profit = 12%

SP = $40480 \times \frac{112}{100}$ = Rs 45337.60

Overall Loss = 46000 - 45337.60 = 662.40.

**Example 10:** A fruit seller sells mangoes at the rate of Rs.9 per kg and thereby loses 20%. At what price per kg, he should have sold them to make a profit of 5%?

Sol: SP = Rs 9, Loss =20%

CP = $9 \times \frac{100}{80}$ = 11.25

Profit = 5%

SP = $11.25 \times \frac{105}{100}$ = Rs. 11.81

**Example 11:** A book was sold for Rs.27.50 with a profit of 10%. If it were sold for Rs.25.75, then what would have been the percentage of profit?

Sol: SP = Rs 27.50, Profit = 10%

CP = $27.50 \times \frac{100}{110}$ = 25

CP = Rs 25, New SP = Rs. 25.75 Profit = 25.75 - 25 = 0.75

Profit % = $\frac{0.75}{25} \times 100$ =3%

**Example 12:** A man sells two flats at the rate of Rs.1.995 lakhs each. On one he gains 5% and on the other, he loses 5%. His gain or loss percent in the whole transaction is?

Sol:Net percentage change= $5 - 5 + \frac{5 \times (-5)}{100}$ = - 00.25

Loss = 0.25%

**Example 13:** By selling a pen for Rs.15, a man loses one sixteenth of what it costs him. The cost price of the pen is?

Sol:Let CP = x, Loss = x/16

According to question,

$X - \frac{X}{16} = 15 \Rightarrow X = 16$

So The CP = Rs. 16

**Example 14:** A shopkeeper professes to sell his goods at cost price but uses a weight of 800 gm instead of kilogram weight. Thus, he makes a profit of?

Sol: Let CP of 1gr = Rs. 1 CP of 800 gr = Rs. 800

CP of 1Kg(1000gr) = Rs.1000 SP of 800gr = Rs. 1000

Profit = 1000 - 800 = 200

Profit % = $\frac{200}{800} \times 100 = 25\%$

**Example 15:**The cost price : selling price of an article is a : b. If b is 200% of a then the percentage of profit on cost price is?

Sol: Gain percentage = $\frac{SP-CP}{CP} \times 100 = \frac{b-a}{a} \times 100$

B = 200% a => b = 2a

$\frac{2a-a}{a} \times 100 = 1 \times 100 = 100$

**Example 16:** Charan purchased a mobile phone and a refrigerator for 15,400 and 19,600 respectively. He sold mobile phone for a profit of 15 percent and the refrigerator for a loss of 20 percent. What is his overall loss/profit?

Sol:C. Pm = 15400, p = 15, C.Pr = 19600, l = 20

SP = 17710 ; SP = 15680

Total C.P. = 15400 + 19600 = 35000

Total S.P. = 17710 + 15680 = 33390

∵ C.P > S.P,

loss = 35000 – 33390 = 1610

**Example 17:**By selling 12 oranges for 60, a man loses 25%. The number of oranges he has to sell for 100, so as to gain 25% is?

Sol: $Sp_1 = \frac{60}{12} = 5$ ; $p_1 = -25\%$ , $S.P_2 = ?$ $P_2 = 25\%$

The shopkeeper has to sell each orange at Rs 25/3. So for Rs 100, he has to sell

$\frac{100 \times 3}{125}$ = 12 oranges

**Example 18 :** The cost price of 400 lemons is equal to the selling price of 320 lemons. Then the profit percent is?

Sol: 400 C.P = 320 S.P

P = $\frac{400-320}{320} \times 100$ =>25%

**Example 19 :**A man sells two tables at the same price. On one he makes a profit of 10% and on the other he suffers a loss of 10%. His loss per cent on the whole transactions is?

Sol: Profit = 10%, loss = 10%

Therefore Overall loss % = $\frac{x^2}{320} = \frac{10 \times 10}{100}$ =1%

**Example 20 :**Prof. Chakravarthy bought a car and got 15% of its original price as a dealer's discount. He then sold it at 20% profit on his purchase price. What percentage profit did he get on the original price?

Sol: Let the original price be 100.

Then C.P = 85, SP= $\frac{120}{100}$ × 85= 102

∵ Original price is 100, percentage profit on the original price = (102 –85)/85×100=20%

# UNIT 2
## CHAPTER 3
## SIMPLE & COMPOUND INTEREST
## BASIC CONCEPT BUILDER

When a person has to borrow some money as a loan from his friends, relatives, bank etc. He promises to return it after a specified time period along with some extra money for using the money of the lender. The money borrowed is called the Principal, usually denoted by P, and the extra money paid is called the Interest, usually denoted by I.The total money paid back, that is, the sum of Principal and the Interest is called the Amount, and is usually denoted by A.

Thus, $A = P + I$

The interest is mostly expressed as a rate percent per year (per annum).Interest depends on, how much money (P) has been borrowed and the duration of time (T) for which it is used. Interest is calculated according to a mutually agreed rate percent, per annum (R).

[i.e. R = r % = 100 ]

When the interest is calculated on the Principal for the entire period of loan, the interest is called simple interest.

Thus, Interest $= \frac{(\text{Principal}) \times (\text{Rate \% per annum}) \times \text{time}}{100}$

Relationship between principal and amount is:

$$P = \frac{100 \times Amount}{100 + RT}$$

**Example 1**: What is the interest on Rs.400 for 3 years at the rate of 6% per annum?

Sol: Interest on Rs 100 for 1 year = 6RS

Interest on Re 1 for 1 year $= \frac{6}{100}$

Interest on Rs 400 for 1 year $= \frac{400 \times 6}{100}$

Interest on Rs 400 for 1 year $= \frac{400 \times 6 \times 3}{100}$ = Rs. 72

**Example 2**: What sum of money will yield Rs. 60 as simple interest at 6% per annum in 5 years?

Sol: $P = \frac{100 \times 60}{6 \times 5}$ = Rs 200

**Example 3**: Find the rate percent annum at which the interest on Rs.600 be Rs. 156 in two years?

Sol: $R = \frac{100 \times 156}{600 \times 2}$ = 13%

**Example 4**: In how many years will a sum of money double itself at 12% per annum?

Sol:

Suppose principal is Rs. P. As it doubles itself, the simple interest is also equal to Rs.P.

Rate = 12%,Time = $\frac{100 \times P}{P \times 12}$ = 8 year 4months

Interest for a number of days: In counting the number of days between two given dates the first day is not included.

**Example 5**: The simple interest on a sum of money is 1/16 of the principal and the number of years is equal to the rate percent per annum. What is the rate of percent?

Sol: Suppose, principal = P ; Time = n years ; Rate = n%

S.I. = $\frac{P}{16} = \frac{P \times n \times n}{100}$ or $\frac{p}{16} = \frac{P \times n^2}{100}$

n2 = $\frac{100}{16} = 2\frac{1}{2}$ %

**Example 6**: A man took a loan from a bank at the rate of 12% p.a. simple interest. After 3 years he had to pay Rs.5400 interest only for the period. The principal amo-unt borrowed by him was?

Sol: Principal = $\frac{100 \times 5400}{12 \times 3}$ = Rs 15,000

**Example 7**: A lent Rs. 5000 to B for 2 years and Rs 3000 to C for 4 years on simple interest at the same rate of interest and received Rs. 2200 in all from both of them as interest. The rate of interest per annum is?

Sol: Let R% is the S.I

$\frac{5000 \times 2 \times R}{100} + \frac{3000 \times 4 \times R}{100} = 2200$

100R + 120R = 2200 220R = 2200

R = 10%

**Example 8**: A sum of money amounts to Rs.9800 after 5 years and Rs.12005 after 8 years at the same rate of simple interest. Then find the rate of interest per annum?

Sol: SI for 3 years = 12005 – 9800 = Rs. 2205

Si for 5 years = $\frac{2205}{3} \times 5$ = Rs. 3675

Principle= 9800 – 3675 = Rs. 6125

Hence Rate = $\frac{100 \times 3675}{6125 \times 5}$ = 12%

# Compound Interest

If this interest is due (not paid) after the decided time period, then it becomes a part of the principal and so is added to the principal for the next time period, and the interest is calculated for the next time period on this new principal. Interest calculated, this way is called compound interest.

The time period after which the interest is added to the principal for the next time period is called the Conversion Period.
The conversion period may be one year, six months or three months and the interest is said to be compounded, annually, semi-annually or quarterly, respectively

$$\text{Compound Interest} = P\left(1+\frac{R}{100}\right)^n - P = P\left[\left(1+\frac{R}{100}\right)^n - 1\right]$$

If the rate of interest differs from year to year i.e. R1 in the first year, R2 in the second year,R3 in the third year. Then

$$A = P\left(1+\frac{R_1}{100}\right)\left(1+\frac{R_2}{100}\right)\left(1+\frac{R_3}{100}\right)$$

When the principal changes every year, we say that the interest is compounded annually. Then,

$$A = P\left(1+\frac{R}{100}\right)^n$$

When the principal changes every six months, we say that the interest is compounded half yearly or semi-annually. Then,

$$A = P\,P\left(1+\frac{R/2}{100}\right)^{2n}$$

When the principal changes every three months, we say that the interest is compounded quarterly. Then,

$$A = P\,P\left(1+\frac{R/4}{100}\right)^{4n}$$

When the interest is compounded annually but time is in fraction say $2\frac{3}{4}$ year. Then

$$A = P\left(1+\frac{R}{100}\right)^2\left(1+\frac{\frac{3R}{4}}{100}\right)$$

The difference between the simple interest and compound interest for 2 years (or terms) is given by the formula

$$D = P\left(\frac{R}{100}\right)^2$$

The above calculations will be clear if we take the Principal to be 1000 and Rate to be 10%.

| Year | Simple Interest | | | Compound Interest | | |
|---|---|---|---|---|---|---|
| | Principal | Interest | Amount | Principal | Interest | Amount |
| 1st | 1000 | 100 | 1100 | 1000 | 100 | 1100 |
| 2nd | 1000 | 100 | 1200 | 1100 | 110 | 1210 |
| 3rd | 1000 | 100 | 1300 | 1210 | 121 | 1331 |

Deductions from the above table:

a. Simple Interest earned in any year is always the same.

b. The SI and CI is same for the first year.

c. CI earned in a year keeps increasing every year.

At CI, $A = P (1 + (r/100))^n$

For CI, the formula is of Amount and for SI the formula is of Interest.

In the formulae of SI, make sure to highlight the fact that SI is directly proportional to P, r and n. Thus if an amount becomes 3 times in 7 years, in how many years will it become 9 times? Amount is not directly proportional to the number of years but for the Simple Interest, it is.

In this case the SI earned is 2P in 7 years and hence to earn a SI of 8P it will take 28 years. However had it been the case of CI, the amount would have become 9 times in 14 years itself because in every 7 years the amount triples, thus in next 7 years 3P will become 9P.

# UNIT 2
## EXERCISE ON CHAPTER 1, 2 & 3
## (Percentage, Profit & Loss, Simple & Compound Interest)
## CONTENT AS PER IBPS/SSC LEVEL

**Q. 1.** The difference between 78% of a number and 59% of the same number is 323. What is 62% of that number?
(a) 1071 (b) 1173 (c) 1037 (d) 1159 (e) None of these

**Q. 2.** Tanya obtained 95% marks in Physics, Chemistry and Maths together and she obtained 225 marks in Social Science, English and Hindi together. If the maximum marks one can obtain in each of the subjects is 100, what is Tanya's overall percentage in all the six subjects together?
(a) 80 (b)75 (c) 90 (d) 95 (e) None of these

**Q. 3.** 40% of 60% of $3/5^{th}$ of a number is 504. What is 25% of $2/5^{th}$ of that number?
(a) 180 (b) 175 (c) 360 (d) 350 (e) None of these

**Q. 4.** In a test consisting of 80 questions carrying one mark each, Arpita answers 65% of the first 40 questions correctly. What percent of the other 40 questions does she need to answer correctly to score 75% on the entire test?
(a) 60 (b) 80 (c) 75 (d) 40 (e) None of these

**Q. 5.** A sum of Rs.2236 is divided among A, B and C such that A receives 25% more than C and C receives 25% less than B, what is A's share in the amount?
(a) Rs. 460 (b) Rs. 890 (c) Rs. 780 (d) Rs.1280 (e) None of these

**Q. 6.** In a class of 65 students and 4 teachers, each student got sweets that are 20% of the total number of students and each teacher got sweets that are 40% of the total number of students. How many sweets were there?
(a) 845 (b) 897 (c) 949 (d) 104 (e) None of these

**Q. 7.** The difference between 54% of a number and 26% of the same number is 22526. Whaat is 66% of that number?
(a) 53097 (b) 48372 (c) 51218 (d) 49124 (e) None of these

**Q. 8.** Vaishali spent Rs.31897 on the air-conditioner for her home, Rs.38789 on buying plasma television and the remaining 23% of the total amount she had as cash with her. What was the total amount?
(a) Rs.74625 (b) Rs.86750 (c) Rs.91800 (d) Cannot be determined (e) None of these

**Q. 9.** In an examination it is required to get 40% of the aggregate marks to pass. A student gets 265 marks and is declared fail by 55 marks. What is the maximum aggregate marks a student can get?
(a) 800 (b) 750 (c) 650 (d) Cannot be determined (e) None of these

**Q. 10.** The difference between 75% of a number and 20% of the same number is 378.4. What is 40% of that number?
(a) 275.2 (b) 274 (c) 267.2 (d) 266 (e) None of these

**Q. 11.** The difference between 56% of a number and 39% of the same number is 425. What is 63% of that number?
(a) 1525 (b) 1650 (c) 1700 (d) 1575 (e) None of these

**Q. 12.** 60 per cent of first number is 40 per cent of the second number. What is the respective ratio of the first number to the second number?
(a) 2 : 3 (b) 21 : 31 (c) 7 : 10 (d) cannot be determined (e) None of these

**Q. 13.** Ramu gave 35% of the amount he had to Shakeel. Shakeel in turn gave two-thirds of what he received from Ramu to Joseph. After spending Rs.150 on lunch out of the amount he got from Shakeel, Joseph now has Rs.550 left with him. How much amount did Ramu have?
(a) Rs.2800 (b) Rs.2000 (c) Rs.3000 (d) Can't be determined (e) none of these

**Q. 14.** If the numerator of a fraction is increased by 200% and the denominator is increased by 300%, the resultant fraction is 15/26. What was the original fraction?
(a) 8/11 (b) 10/11 (c) 9/13 (d) 10/13 (e) None of these

**Q. 15.** In an examination it is required to get 380 of the aggregate marks to pass. A student gets 32% marks and is declared failed by 76 marks. What are the maximum aggregate marks a student can get?
(a) 945 (b) 975 (c) 950 (d) Cannot be determined (e) None of these

**Q. 16.** A cricketer has batted in 105 innings. He has scored 17 centuries, crossed the 50- run mark 28 times and crossed the 25-run mark 39 times. The no. of times he has scored below 25 is what percentage of the number of times he scored between 25 and 49 ( both 25 and 49 included)?
(a) 450% (b) 600% (c) 500% (d) cannot be determined (e) None of these

**Q. 17.** Sunil scored 54 percent marks in a test. Ravi scored 450 marks in the same test which is 300 less than Sonu. Sunil's score is 60 more than Sonu. If Ram scored 900 marks in the test, what is Ram's percentage?
(a) 80 (b) 65 (c) 75 (d) 60 (e) None of these

**Q. 18.** In a school there are 800 students out of whom 45 percent are girls. Monthly fee of each boy is Rs.600 and monthly fee of each girl is 30 percent less than each boy. What is the total monthly fee of girls and boys together?
(a) Rs.425400 (b) Rs.414600 (c) Rs.419600 (d) Rs.423400 (e) None of these

**Q. 19.** In a class of 50 students and 5 teachers, each student got sweets that are 12% of the total number of students and each teacher got sweets that are 20% of the total number of students. How many sweets were there?
(a) 345 (b) 365 (c) 330 (d) 350 (e) None of these

**Q. 20.** In an election between two candidates, one got 52% of the total valid votes. 25% of the total votes were invalid. The total number of votes were 8400. How many valid votes did the other person get?
(a) 3276 (b) 3196 (c) 3024 (d) Cannot be determined (e) None of these

**Q. 21.** In a school there are 250 students out of whom 12 per cent are girls. Each girl's monthly fee is Rs.450/- and each boy's monthly fee is 24 percent more than a girl. What is the total monthly fee of girls and boys together?
(a) Rs.136620/- (b) Rs.136260/- (c) Rs.132660/- (d) Rs.132460/- (e)None of these

**Q. 22.** If the height of a triangle is decreased by 40% and its base is increased by 40% and its base is increased by 40%, what will be the effect on its area?
(a) No change (b) 16% increase (c) 8% decrease (d) 16% decrease (e) None of these

**Q. 23.** An HR Company employs 4800 people, out of which 45 per cent are males and 60 per cent of the males are either 25 years or older. How many males are employed in HR Company who are younger than 25 years?
(a) 2640 (b) 2160 (c) 1296 (d) 864 (e) None of these

**Q. 24.** Six-eleventh of a number is equal to twenty two per cent of second number. Second number is equal to the one-fourth of third number. The value of the third number is 2400. What is the 45% of first number?
(a) 109.8 (b) 111.7 (c) 117.6 (d) 123.4 (e) None of these

**Q. 25.** Raman scored 456 marks in an exam and Seeta got 54 percent marks in the same exam which is 24 marks less than Raman. If the minimum passing marks in the exam is 34 per cent, then how much more marks did Raman score than the minimum passing marks?
(a) 184 (b) 196 (c) 190 (d) 180 (e) None of these
**Ans: (a) 184**

**Q. 26.** Jasmine scored 52 marks in Science, 36 marks in Hindi, 47 marks in English and 73 marks in Sanskrit. The total marks of all the subjects together is 400. What is the overall percentage of marks she got?

(a) 56 (b) 48 (c)45 (d) 52 (e) None of these

**Q.27.** A shopkeeper labeled the price of his articles so as to earn a profit of 30% on the cost price. He then sold the articles by offering a discount of 10% on the labeled price. What is the actual percent profit earned in the deal?
(a) 18% (b)15% (c)20% (d)Cannot be determined (e)None of these

**Q.28.** Profit earned by an organization is distributed among officers and clerks in the ratio of 5:3 respectively. If the number of officers is 45 and the number of clerks is 80 and the amount received by each officer is Rs.25,000/-, what was the total amount of profit earned?
(a)Rs.22 lakhs (b)Rs.18.25 lakhs (c)Rs.18 lakhs (d)Rs.23.25 lakhs (e) None of these

**Q.29.** The cost of 8 gel pens and 12 ball pens is Rs.82. What would be the cost of 36 gel pens and 54 ball pens?
(a) Rs.366 (b)Rs.365 (c)Rs.369 (d)Rs.364 (e)None of these

**Q.30.** A merchant sells his two cars – one at 15% loss and another at 12% profit. If the cost prices of the two cars are in the ratio of 1:2, what is his percent profit or loss?
(a)3% profit (b)2% loss (c)2% profit (d)1.2%loss (e)None of these

**Q.31.** The profit earned after selling an article for Rs.675 is twice the loss incurred after selling the article for Rs.435. What is the cost price of the article?
(a)Rs.450 (b)Rs.595 (c)Rs.400 (d)Rs.450 (e)None of these

**Q.32.** Mohan purchased 15 kgs of rice at the rate of Rs.26 per kg and 8 kgs of pulses at the rate of Rs.26 per kg. Whaat is the total amount that he paid to the shopkeeper?
(a)Rs.598 (b)Rs.594 (c)Rs.596 (d)Rs. 595 (e) None of these

**Q.33.** Suhas sold an item for Rs.7500 and incurred a loss of 25%. At what price, should he have sold the item to have gained a profit of 25%?
(a)Rs.13800 (b)Rs.12500 (c)Rs.11200 (d)Cannot be determined (e) None of these

**Q.34.** A man purchases some eggs for Rs.500. 15% of the eggs break during transportation. What profit percentage should he take on the remaining to get an overall profit of 20%?
(a)37.5 (b)30 (c)42 (d)41.17 (e)45

**Q.35.** The owner of an electronics shop charges his customer 25% more than the cost price. If a customer paid Rs.11,500 for a television set, then what was the cost price of the television set?
(a)Rs.9200 (b)Rs.7200 (c)Rs.8600 (d)Rs.9800 (e)Rs.10000

**Q.36.** Gina invests Rs.48000/- to start a business, 4 months later Shrayon joins her by investing Rs.62000/- and another two months later Deepika joins them both by investing Rs.80000/-. At the end of one year the business earns a profit of Rs.20661/-. What is Deepika's share in the profit?

(a)Rs.7668/- (b)Rs.6603/- (c)Rs.7240/- (d)Rs.6390/- (e)None of these

**Q.37.** A person bought an old TV at Rs.4000 and spent 20% of its cost on repairing. If the person wants to make a net profit of Rs.520, to what percentage should he add, in the purchase price while determining the selling price?

(a)24% (b)28% (c)30% (d)33% (e)None of these

**Q.38.** If the cost of 10 tables and 15 chairs is Rs.20000 what will be the cost of tables and 21 chairs?

(a)Rs.27500 (b)Rs.28000 (c)Rs.32000 (d)Rs.36000 (e)None of these

**Q. 39.** If the cost of 12 pencils is equal to selling price of 10 pencils, the profit per cent in the transaction is

(a) 16 2/3% (b) 18% (c) 20% (d)25% (e) None of these

**Q. 40.** When a discount of 12% on the marked price of an article is allowed, the article is sold for Rs.264. The marked price of the article is

(a) Rs.300 (b) Rs.276 (c)Rs.312 (d)Rs.325 (e)None of these

**Q. 41.** Successive discounts of 20% and 15% are equivalent to a single discount of

(a)35% (b)32% (c)17.5% (d)17% (e) None of these

**Q. 42.** A man sells two tables at the same price. On one he makes a profit of 10% and on the other he suffers a loss of 10%. His loss percent on the whole transaction is

(a) 0 (b) 1 (c) 2 (d) 5 (e) None of these

**Q. 43.** If the cost price of 50 oranges is equal to the selling price of 40 oranges, then the profit per cent is

(a) 5 (b) 10 (c) 20 (d) 25 (e) None of these

**Q. 44.** By selling an article at 80% of its marked price, a merchant makes a loss of 12%. What will be the percent profit made by the merchant if he sells the article at 95% of its marked price?

(a) 5% profit (b) 1% loss (c) 10% profit (d) 5.5% profit (e) 4.5% profit

**Q. 45**. A man bought some toys at the rate of 10 for Rs. 40 and sold them at 8 for Rs. 35. Find his gain or loss percent.
(a) 5% profit (b) 1% loss (c) 15% profit (d) 5.5% profit (e) none of these

**Q. 46.** A dishonest merchant sells his grocery using weights 15% less than the true weights and makes a profit of 20%. Find his total gain percentage.
(a) 35% (b) 30% (c) 41.17 % (d) 50% (e) none of these

**Q. 47.** What is the maximum percentage discount that a merchant can offer on her Marked Price so that she ends up selling at no profit or loss, if she had initially marked her goods up by 50%?
a. 50% b. 20% c. 25% d. 16.67% e. 33.33%

**Q. 48.** There are three successive discounts on a shirt 10 %, 8 % and 6 % . Find exact single discount to all these three discounts.

(a) 23.11 % (b) 22.17 % (c) 21.45 % (d) 20.20 %

**Q. 49.** A printer manufacturer initially makes a profit of 12 % by selling a particular model of printer for Rs 6500. If the cost of manufacturing of that printer increases by 25 %, then price paid by customer is increased by 15 %. Find the % profit made by the manufacturer ?
(a) 4.5 % (b) 5.7 % (c) 6.2 % (d) 3.5 %

**Q. 50.** Kartik calculates his profit percentage on the selling price whereas Shyam calculates his profit percentage on the cost price. They find that the difference of their profits is Rs 100 . If the selling price of both of them are the same and both of them get 25 % profit, find their selling price.
(a) 2400 (b) 2000 (c) 2100 (d) 2150

**Q. 51.** A fruit vendor fixed his selling price of mangoes at 40 % above the cost price. He sells half of the stock of mangoes at this price, now he offers a discount of 15 % on original selling price for one quater of stock and rest at a discount of 30 % on original selling price. Find the gain percentage altogether ?
(a) 20.30 % (b) 21.22 % (c) 25.45 % (d) 24.25 %

**Q. 52.** A textile vendor sells shirts at Rs. 800 per shirt, however he forced to give two successive discounts of 10 % and 5 % respectively. However he charges sales tax on net sales price from the customer at 5 %. What price does customer has to pay to buy the shirt ?
(a) 690.20 (b) 700.80 (c) 718.20 (d) 722.34

**Q. 53.** By selling an article at 2/5 of the marked price, there is a loss of 25 % , The ratio of the marked price and the cost price of the article is :
(a) 2 : 5 (b) 8 : 15 (c) 15 : 8 (d) 5 : 2

**Q. 54.** Six mangoes were bought at Rs 5 and 5 mangoes sold for Rs 6. Then find out the gain percentage ?
(a) 39 % (b) 42 % (c) 44 % (d) 45 %

**Q. 55.** Braun invested a certain sum of money at 8% p.a. simple interest for 'n' years. At the end of 'n' years, Braun got back 4 times his original investment. What is the value of n?
a. 50 years b. 25 years c. 12 years 6 months d. 37 years 6 months

e. 40 years

**Q. 56.** Shawn invested one half of his savings in a bond that paid simple interest for 2 years and received $ 550 as interest. He invested the remaining in a bond that paid compound interest, interest being compounded annually, for the same 2 years at the same rate of interest and received $605 as interest. What was the value of his total savings before investing in these two bonds?

a. $ 5500 b. $ 11000 c. $ 22000 d. $ 2750 e. $ 44000

**Q. 57.** Ann invested a certain sum of money in a bank that paid simple interest. The amount grew to $240 at the end of 2 years. She waited for another 3 years and got a final amount of $300. What was the principal amount that she invested at the beginning?

a. $ 200 b. $ 150c. $ 210d. $ 175e. Insufficient data

**Q. 58.** Peter invested a certain sum of money in a simple interest bond whose value grew to $300 at the end of 3 years and to $ 400 at the end of another 5 years. What was the rate of interest in which he invested his sum?

a. 12% b.12.5% c. 6.67% d. 6.25% e. 8.33%

**Q. 59.** Find the compound interest on Rs. 9375 at 8% per annum for 2 yr.

a) Rs.1560 b) Rs.1512 c) Rs.1590 d) Rs.1548

**Q. 60.** The difference between compound Interest and simple interest on an amount of Rs. 15,000 for 2 years is Rs. 96. What is the rate of interest per annum?

a) 8 b) 11 c) 12 d) None of these

Q. 61. The difference between the simple interest the compound interest on Rs. 8000 at 10% per annum 3 yr is

a) Rs. 260 b) Rs. 352 c) Rs.248 d) Rs. 310

**Q. 62.** A sum of Rs. 12,000 deposited at compound interest becomes double after 5 years. After 20 years, it will become:

a) Rs. 1,10,000 b) Rs. 1,30,000 c) Rs. 1,24,000 d) Rs. 1,92,000

**Q. 63.** The least number of complete years in which a sum of money put out at 20% compound interest will be more than doubled is:

a) 7 b) 4 c) 5 d) 8

**Q. 64.** Sum of money becomes Rs.13,380 after3 years and Rs. 20,070 after 6 years on compound interest. The sum iS

a) Rs. 9200 b) Rs. 9000 c) Rs. 8920 d) Rs. 9040

**Q. 65.** A sum of money invested at compound interest amounts to Rs. 800 in 3 years and to Rs. 840 in 4 years. The rate of interest per annum is:

a) 4% b) 8% c) 5% d) 6%

**Q. 66.** The compound interest on a sum of money for 2 years is Rs. 832 and the simple interest on the same sum for the same period is Rs. 800. The difference between the compound interest and the simple interest for 3 years will be:

a) Rs. 50 b) Rs. 6 7 c) Rs. 98.56 d) Rs. 75.45

**Q. 67.** The difference between the simple Interest on a certain sum at the rate of 10% per annum for 2 years and compound interest which is compounded every 6 months is Rs. 124.05. What is the principal sum?
a) Rs. 9000 b) Rs.8000 c) Rs.10,000 d) Rs. 13,000

**Q. 68.** A man deposited a total sum of Rs.88400 in the name of his two sons aged 19 and 17 yr, so that at the age of 21 ,both will get equal amounts. If the money is invested at the rate of 10% compound interest per annum. What are the shares of his two sons?
a) Rs. 48800, Rs. 40000 b) Rs. 48400, Rs. 48000 c) Rs. 48400, Rs.40000 d) Rs. 48000, Rs. 40000

**Q. 69.** A sum of money at simple interest amounts to Rs.1012 in 2 ½ years and to Rs.1067.20 in 4 years. The rate of interest per annum is
(a) 2.5% (b) 3% (c) 4% (d) 5% (e) None of these

**Q. 70.** If the compound interest on a sum for 2 years at 12 ½% per annum is Rs.510, the simple interest on the same sum at the same rate for the same period of time is
(a) Rs.400 (b) Rs.480 (c) Rs.450 (d) Rs.460 (e) None of these

**Q. 71.** In 4 years, the simple interest on a certain sum of money is 9/25 of the principal. The annual rate of interest is
(a) 4% (b) 4 ½% (c) 9% (d) 10% (e) None of these

**Q. 72.** A sum of money invested at compound interest amounts to Rs.800 in 3 years and to Rs.840 in 4 years. The rate of interest per annum is
(a) 2 ½% (b) 4% (c) 5% (d) 6 2/3% (e) None of these

**Q. 73.** The difference between simple and compound interest on a certain sum of money for 2 years at 4 per cent per annum is Re.1. The sum of money is
(a) Rs.600 (b) Rs.625 (c) Rs.560 (d) Rs.650 (e) None of these

**Q. 74.** What sum of money will become Rs.1352 in 2 years at 4 per cent per annum compound interest?
(a) Rs.1200 (b) Rs.1225 (c) Rs.1250 (d) Rs.1300 (e) None of these

**Q. 75.** A certain sum of money amounts to Rs.756 in 2 years and to Rs.873 in 3 ½ years at a certain rate of simple interest. The rate of interest per annum is
(a) 10% (b) 11% (c) 12% (d) 13 % (e) None of these

**Q. 76.** A certain part of an amount of Rs.7200 was lent at 8% p.a. and the remaining at 12% p.a. If the total simple interest from both the parts in four years was Rs.2944, what is the amount which was lent at 8% p.a. interest?
(a) Rs.3200 (b) Rs.3500 (c) Rs. 3600 (d) Rs.4000 (e) Rs.4800

**Q. 77.** A person lent a certain sum of money at 8% simple interest and in 8 years the interest amounted to Rs.216 less than the sum lent. What is the sum that the person lent?
(a) Rs.1800 (b) Rs.1200 (c) Rs.800 (d) Rs.600 (e) None of these

**Q. 78.** Equal amounts are deposited in two banks each at 3.5% p.a. for 12 years and 8.5 years respectively. If the difference between their interests is Rs.189.875 then what is the amount?
(a) Rs.1550 (b) Rs.1650 (c)Rs.1750 (d) Rs.1850 (e) Rs.1950

**Q. 79.** A certain amount becomes Rs.627200 in two years and Rs.702464 in three years. If the interest is compounded yearly what is the rate of interest?
(a) 11% (b) 12% (c) 13% (d) 14% (e) 15%

**Q. 80.** A man gets a simple interest of Rs.1000 on a certain principal at the rate of 5 p.c.p.a. in 4 years. What compound interest will the man get on twice the principal in two years at the same rate?
(a) Rs.1050 (b) Rs.1005 (c) Rs.11025 (d) Rs.10125 (e) none of these

**Q. 81.** A person lent some amount @ 12% p.a. simple interest, and after 8 years he interest amounted to Rs.312 less than the amount lent. What is the amount that person lent?
(a) Rs.7000 (b) Rs.7200 (c) Rs.7400 (d) Rs.7600 (e) Rs.7800

**Q. 82.** Rs. 7800 becomes Rs.12480 in five years when the interest is simple. If the rate of interest is increased by 6% then what will be the total amount after five years?
(a) Rs. 14820 (b) Rs.14920 (c) Rs.15820 (d) Rs.16820 (e) Rs.17820

**Q. 83.** The simple interest accrued on a certain principal in 5 years at the rate of 12 p.c.pa. is Rs.1536. What amount of the simple interest would one get if one invests Rs.1000 more than the previous principal for 2 years and at the same rate pc.p.a.?
(a) Rs.845.40 (b) Rs.614.40 (c) Rs.2136 (d) Rs.1536 (e) None of these

**Q. 84.** A person lent a certain sum of money at 8% simple interest and in eight years, the interest amounted to Rs.635.40 less than the amount lent. What is the amount the person lent?
(a) Rs.1725 (b) Rs.1735 (c) Rs.1745 (d) Rs.1755 (e) Rs.1765

**Q. 85.** A sum of money invested at compound interest amounts to Rs.800 in 3 years and to Rs.840 in 4 years. The rate of interest per annum is
(a) 2 ½% (b) 4% (c) 5% (d) 6 2/3% (e) None of these

**Q. 86.** The difference between simple and compound interest on a certain sum of money for 2 years at 4 per cent per annum is Re.1. The sum of money is
(a) Rs.600 (b) Rs.625 (c) Rs.560 (d) Rs.650 (e) None of these

**Q. 87.** What sum of money will become Rs.1352 in 2 years at 4 per cent per annum compound interest?
(a) Rs.1200 (b) Rs.1225 (c) Rs.1250 (d) Rs.1300 (e) None of these

**Q. 88.** A certain sum of money amounts to Rs.756 in 2 years and to Rs.873 in 3 ½ years at a certain rate of simple interest. The rate of interest per annum is
(a) 10% (b) 11% (c) 12% (d) 13 % (e) None of these

**Q. 89.** A certain part of an amount of Rs.7200 was lent at 8% p.a. and the remaining at 12% p.a. If the total simple interest from both the parts in four years was Rs.2944, what is the amount which was lent at 8% p.a. interest?
(a) Rs.3200 (b) Rs.3500 (c) Rs. 3600 (d) Rs.4000 (e) Rs.4800

**Q. 90.** A person lent a certain sum of money at 8% simple interest and in 8 years the interest amounted to Rs.216 less than the sum lent. What is the sum that the person lent?
(a) Rs.1800 (b) Rs.1200 (c) Rs.800 (d) Rs.600 (e) None of these