Question
A man borrows $39000 for 1 and half year at a rate of 1.65%. What is the simple interest he has to pay? (Marks 2)

Solution:
Simple interest is given by
\[ I = \frac{P \times R \times T}{100} \]
P = principal = $39000
R = interest rate = 1.65%
T = 1.5 year
Interest, \( I = \frac{39000 \times 1.65 \times 1.5}{100} = Rs \ 965.25 \)

Question
If Cost price = 2000Rs and Selling price = 6500Rs, Then what will be % Markup on cost? (Marks 2)

Solution:
\[ \text{MUC} = \text{S - C} \] (Rs markup on cost = selling price - cost price) = 6500 - 2000 = Rs 4500
% markup on cost = \( \frac{\text{MUC}}{\text{cost price}} \times 100 = \frac{4500}{2000} \times 100 = 225\% \)

Question
A gold chain is sold for Rs. 6500 at a gain of 25%. Find the profit. (Marks 5)

Solution:
Selling price = 6500
Profit = 25%
Profit in Rs = \( \frac{6500 \times 25}{100} = Rs \ 1625 \)

Question (Marks 3)
Find the single discount rate that is equivalent to the series 18%, 12%, 9%.

Solution:
Let list price = 100
Series trade discount: Net price = List price (1-d1)(1-d2)....(1-dn)
= 100 (1 - .18)(1 - .12)(1 - .09)
= 100(.82)(.88)(.91)
= 100(.657) = 65.7
Single discount rate = 100 – 65.7 = 34.3%
Question (Marks 5)
Compute the amount of compound interest for Rs 3500 at 6% per annum for 2 years.
Solution:
\[ S = P(1 + \frac{R}{100})^n \]
\[ S = \text{Money accrued after n years also called compound amount} \]
\[ P = \text{Principle amount} \]
\[ R = \text{Rate of interest} \]
\[ n = \text{number of periods} \]
\[ S = 3500 \times (1 + \frac{6}{100})^2 \]
\[ = 3500 \times (1 + 0.06)^2 \]
\[ = 3500 \times (1.06)^2 \]
\[ = 3500 \times 1.1236 \]
\[ S = 3933 \]
Compound interest = \[ S - P = 3933 - 3500 = 433 \]

Question (Marks 3)
The mean of the numbers 10, 7, 9, 2 and x is 11; find the value of x.
Solution
Total = 5 \times 11 = 55
Total = 10 + 7 + 9 + 2 + x = 55
28 + x = 55
x = 55 - 28 = 27
x = 27

Question (Marks 5)
The salary of an employee is as follows:
Basic salary = 50,000 Rs.
What is the amount of allowances if House Rent = 45%, Conveyance allowance = 2.5 % and Utilities allowance = 2.5 %?
Solution:
House Rent = 50000 \times 45/100 = 22500
Conveyance Allowance = 50000 \times 2.5/100 = 1250
Utilities Allowance = 50000 \times 2.5/100 = 1250

Question (Marks 5)
If the price of 16 dozen of eggs and 10 breads of large size is 332. The price of 10 dozen of eggs and 8 breads of large size is 225. Find the prices of per dozen eggs and per bread.
(Solve this question by using matrices only)
Solution:
192x + 10y = 332
120x + 8y = 225
From equation 2
8y = 225 - 120x
y = (225 - 120x) / 8
Putting values in equation 1
192x+10(225-120x)/8 = 332
192x+281.25-150x = 332
(192-150)x = 332-281.25
42x = 50.75
x = 1.21
y = (225-120*1.21)/8
y = 10

Question (Marks 2)
A man borrows $39000 for 1 and half year at a rate of 1.65%. What is the simple interest he has to pay?
Solution:
Simple interest is given by
I = \( P \times R \times T / 100 \)
P = principal = $39000
R = interest rate = 1.65%
T = 1.5 year
Interest, I = \( (39000 \times 1.65 \times 1.5) / 100 \) = Rs 965.25

Question (Marks 2)
If Cost price = 2000Rs and Selling price = 6500Rs Then what will be % Markup on cost?
Solution:
MUC = S - C (Rs markup on cost = selling price - cost price) = 6500 - 2000 = Rs 4500
% markup on cost = \( (MUC / \text{cost price}) \times 100 \) = \( (4500 / 2000) \times 100 \) = 225%

Question (Marks 2)
Find the Discount where price is 2000 and discount rate is 12%.
Solution:
Price = 2000
Discount rate = 12%
Discount = Price \times rate
Discount = 2000 \times 12 / 100
Discount = 240
Question (Marks 3)
Calculate compound interest earned on Rs. 2250 invested at 8% per annum for 6 years
Solution:
Compound interest = \((1 - (1.08)^6) \times 2250\) = 1320

Question
If the Basic salary of an employee is Rs 8000 and Allowances are Rs 4,000 What are the cost on account of 20 casual and 10 sick leaves per year if normal working days per month are 26?
Solution:
Cost of casual leaves per year = \((18 / (26 \times 12)) \times 12000 \times 12 = 8307.7\) Rs
Cost of Sick leaves per year = \((12 / (26 \times 12)) \times 12000 \times 12 = 5538.5\) Rs

Question (Marks 10)
The price of medicine inventory is Rs. 500,000. The series discounts are 20%, 10%, 5%. What is the single equivalent discount rate? If invoice was dated May 1st and 10% discount is offered if invoice is paid up to 10th May. What will be net payment for invoice value of Rs. 500,000 if paid up to 10th May?
Solution:
List Price=500,000
D1=20%
D2=10%
D3=5%
Net price=N= L \((1-d1) \times (1-d2) \times (1-d3)\)
= 500,000\((1-0.20) \times (1-0.10) \times (1-0.05)\)
= 342,000
Single discounted rate is given by
Here we see N=L(1-d)
=500000\((1-31.6%)\)
=342000
So we can say that
31.6% is a single discounted rate
Payment over 10th of May= 500,000\((1- 10\%)\) = 450,000 Rs

From Assignments

Question
If gross salary of an employee is Rs.18, 000 per month then calculate the cost on account of

- Casual leaves=18 days per year
- Earned leaves=18 days per year
- Sick leaves=12 days per year,
If normal working days per month is 20 then What is the total cost of leaves as percent of gross salary?
Solution:

Gross salary= Rs.18, 000

Cost of casual leaves per year= \( \frac{18}{(20*12)} \times (18000*12) \) =16200

Cost of earned leaves per year= \( \frac{18}{(20*12)} \times (18000*12) \) =16200

Cost of sick leaves per year= \( \frac{12}{(20*12)} \times (18000*12) \) =10800

Total cost of leaves per year= 16200+16200+10800=43200

Total cost of leaves as percent of gross salary= \( \frac{43200}{(12*18000)} \) \times 100

20%

Question

An investment has been made for a period of 3 years. Rates of return for each year are 3%, 9% and 8% respectively. If you invested Rs. 200,000 at the beginning of the term, how much will you have at the end of the last year?

Solution:

Amount at the end of the last year = \( 200,000(1+3\%)(1+9\%)(1+8\%) \)

= 200,000*1.03*1.09*1.08

= Rs. 242503.2

Question:

If you invested Rs.75,000 at the rate of 15% per annum for 10 years. Calculate simple as well as compound interest of the amount.

Solution:

For simple interest, we use

\[ I= \frac{P \times R \times T}{100}, \]

Where \( I \) = simple interest

\( P \) = principal
Here

I = (75000 * 15 * 10) / 100 = Rs. 112500

For compound interest, we use

S = P(1+r/100)^n,

Where S = compound interest

P = principal

r = rate of interest

n = time in years

Here

S = 75000(1+15/100) ^10

= 303416.83 Rs

**Question**

If you deposit Rs.10,000 at the end of each month into an account with earning rate 6%, how much will you have after 10 years?

**Solution:**

Amount of annuity = C = 10,000

Rate of interest = i = 0.06/12 = 0.005

Number of periods = n = 10 * 12 = 120

So, Future value is
\[ C \left[ \frac{(1+i)^n - 1}{i} \right] = 10,000 \left[ \frac{(1+0.005)^{120} - 1}{0.005} \right] = Rs.1638793.5 \]

**Question**

If the Basic salary of an employee is Rs. 22000

(a) What is the total saving per month of the employee on account of Provident Trust Fund?

(b) What is the amount of allowances if House Rent = 45 \%,

Conveyance allowance = 2.5 \% and Utilities allowance = 2.5 \%?

**Solution:**

(a) Basic salary = Rs 22000

Employee contribution to Provident Fund = 1/11 \times 22000 = 2000 Rs.

Company contribution to Provident Fund = 1/11 \times 22000 = 2000 Rs.

Total savings of employee in Provident Fund = 2000+2000 = 4000 Rs.

( b ) House rent allowances = 0.45 \times 22000 = Rs 9900

Conveyance allowance = 0.025 \times 22000 = 550 Rs.

Utilities allowance = 0.025 \times 22000 = 550 Rs.

Thus total allowances are 9900+550+550 = Rs 11000

**Question**

Mr. Ahmed used part of an insurance settlement to purchase an ordinary annuity that would pay him Rs. 5,500 each six months for 10 years. How much did the annuity cost if the interest rate is 10\% compounded semiannually? (discounted value)

**Solution:**
Question

Suppose you opened an account in a bank on January 1, 2003, with a deposit of Rs. 50,000 then you added Rs.12000 same day. What will be your account amount on July 1, 2005, if the plan earns a fixed rate of interest 11% per annum, compounded semi-annually?

Solution:

Principle = 50000 + 12000 = 62000

n = 5

(I2 = 11% / 2 = 5.5% = .055)

S2 = 62000 (1.055) 5

S2 = Rs. 81031

Question

Payments of Rs. 9,000 were made at the end of each quarter into an account that pays an interest of 13% compounded quarterly. How much will be in that account after seven years?

Solution:

P = Rs. 9000

n = 7 x 4 = 28

i = (13/4) % = 0.0325

S = P[((1+i)^n)-1)/i]

S = 90000 [(1+0.0325)28-1]/0.0325]

S = 9000(44.572975)

S = Rs. 401156.78 or Rs. 401156
Question

Suppose you are managing an account in which you deposit Rs. 30,000 at the end of each year for 20 years. How much amount you have accumulated with the assumption that you earn 6% interest compounded annually.

Solution:

\[ FV = 30,000 \times \left[ \frac{(1+0.06)^{20}-1}{0.06} \right] = 1103,567.74 \]

Question 2:

Calculate the present value of an annuity of Rs.30,000 paid at the end of each month of 3 years. The annual interest rate is 12%.

Solution:

We have,

Periodic Payment \( R = 30000 \)
Number of Periods \( n = 3 \times 12 = 36 \)
Interest Rate \( i = \frac{12}{12} = 1\% \)

Present Value \( PV = 30000 \times \left[ \frac{1-(1+0.01)^{-36}}{0.01} \right] \)

\[ PV = 30000 \times \left[ \frac{1-(1+0.01)^{-36}}{0.01} \right] = 903,225.15 \]
Question

The salary of an employee is as follows:

Basic salary = 20,000 Rs.
Allowances = 8,000 Rs.

What is the cost of the company on account of leaves (18.2%), group insurance/medical (5%) and other social benefits (5.8%)?

Solution:

Gross Salary = 20000 + 8000 = Rs. 28000
Leaves Cost = 0.182 x 28000 = Rs. 5096
Group Insurance/Medical = 0.05 x 28000 = Rs. 1400
Other Social Benefits = 0.058 x 28000 = Rs. 1624
Total Social Charges = 5096 + 1400 + 1624 = Rs. 8120

Question

The salary package of a permanent employee includes:

Basic salary = Rs. 40,000
House rent = 45 %
Conveyance allowance = 2.5 %
Medical insurance = 5 %
Social charges = 5 %

If provident fund will not be given to him then find the gross remuneration.

Solution:

Basic Salary = Rs. 40000
House rent = 0.45 x 40000 = Rs. 18000
Conveyance Allowance = 0.025 x 40000 = Rs. 1000
Medical Allowance = 0.05 x 40000 = Rs. 2000
Social Charges = 0.05 x 40000 = Rs. 2000
Gross Remuneration = 40000 + 18000 + 1000 + 2000 + 2000
= Rs. 63000

Question:
If house rent (45% of basic salary) of an employee is Rs.8100 then calculate the followings

- Amount of basic salary
- Total amount of allowances given to the employee, if conveyance allowance is 2.5% and utility allowance is 3.5% of basic salary.

Solution:
House rent = 8100
As, house rent = basic salary * 45%
8100 = basic salary * 0.45
Basic salary= 8100/0.45=18000
Conveyance allowance=18000*0.025=450
Utility allowance=18000*0.035=630
Total amount of allowances=8100+450+630=9180

Question
An investment has been made for a period of 4 years. Rates of return for each year are 7%, 8%, -9% and 5% respectively. If you invested Rs. 150,000 at the beginning of the term, how much will you have at the end of the last year?

Solution:
Amount at the end of the last year = 150,000(1+7%)(1+8%)(1-9%)(1+5%)
= 150,000*1.07*1.08*0.91*1.05
= Rs. 165626.37

Question
If you invested Rs.80,000 at the rate of 11% per annum for 8 years. Calculate simple as well as compound interest of the amount.
Solution:

For simple interest, we use
\[ I = \frac{P \times R \times T}{100}, \]

Where \( I \) = simple interest
\( P \) = principal
\( R \) = rate of interest percent per annum
\( T \) = time in years

Here
\[ I = \frac{80,000 \times 11 \times 8}{100} = \text{Rs. 70400} \]

For compound interest, we use
\[ S = P \left(1 + \frac{r}{100}\right)^n, \]

Where \( S \) = compound interest
\( P \) = principal
\( r \) = rate of interest
\( n \) = time in years

Here
\[ S = 80,000 \left(1 + \frac{11}{100}\right)^8 = \text{Rs.184363.02} \]

Compound interest = \( S - P \)
\[ = 184363.02 - 80000 = 104363.02 \]

Question

If you deposit Rs.20,000 at the end of each month into an account with earning rate 5%, how much will you have after 10 years?

Solution:

Amount of annuity = \( C = 20,000 \)
Rate of interest = \( i = \frac{0.05}{12} = 0.0042 \)

Number of periods = \( n = 10 \times 12 = 120 \)

So, Future value is

\[
C \left[ \frac{(1+i)^n - 1}{i} \right]
\]

\[
= 20,000 \left[ \frac{(1 + 0.0042)^{120} - 1}{0.0042} \right]
\]

\[
= Rs.31122300.83
\]

Question

If basic Salary of an employee is Rs. 20,000 per month, then calculate the amount of

1. Utilities Allowance (12%)
2. House rent (35%)
3. Miscellaneous Social charges (6%)
4. Medical/Group insurance (7.5%)

Clearly stating calculation of which is based on gross salary and which are based on basic salary.

Solution:

<table>
<thead>
<tr>
<th>BENEFITS</th>
<th>Amount of Basic/Gross Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities Allowance</td>
<td>( \frac{12}{100} \times 20,000 = 2000 )</td>
</tr>
<tr>
<td></td>
<td>Utility allowances are calculated on basic salary.</td>
</tr>
<tr>
<td>House Rent</td>
<td>( \frac{35}{100} \times 20,000 = 7000 )</td>
</tr>
<tr>
<td></td>
<td>House rent is calculated on basic salary.</td>
</tr>
</tbody>
</table>
Question

Sales of an outlet on Saturday were 25,000, which grew up 35,000 on Sunday. Calculate the percentage change. Also, write down the steps performed on excel.

Solution:

Method

First calculate the change by the formula

\[
\text{Change} = \text{Final value} - \text{Initial Value.}
\]

\[
\% \text{ Change} = \frac{\text{Change}}{\text{Initial Value}} \times 100
\]

Calculations

Initial value = 25,000

Final Value = 35,000

Change = Final Value – Initial Value = 35,000 – 25,000 = 10,000

% Change = \frac{\text{Change}}{\text{Initial Value}} \times 100 = \frac{10,000}{25,000} \times 100 = 40\%
Question

Ali started working in an organization with an earning of 15,000 rupees per month. His organization signed a three year collective agreement that provided for wage increases of 3.5%, 5.5% and 7.5% in successive years. What should be his earning per month at the end of the term of contract.

Solution:

Ali’s present salary =15,000

Salary at the end of first year = 15,000× (1+3.5%) = 15,000× (1+0.035) = 15,000×1.035
=15,525

Salary at the end of second year = 15,525× (1+5.5%) = 15,525× (1+0.055) = 15,525×1.055
=16,378.88 = 16,379

Salary at the end of third year (end of the term of the contract) = 16,378.88× (1+7.5%) = 16,378.88× (1.075) =17,607.29

Question

Payments of Rs. 8,500 were made at the end of each quarter into an account that pays an interest of 11% compounded quarterly. How much will be in that account after five years?

Solution:

P = Rs. 8,500
n = 5 x 4 = 20
i = (11/4) % = 0.0275

S = P× [(((1+i)^n)-1)/i]

S = 8,500× [(1+0.0275)^20-1)/0.0275]
S = 8,500× (26.1973975)

S = Rs. 2,22,678.2