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# SMART NOTES

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# SMART NOTES

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## PREFACE

**Mathematics & Statistics Part – II ‘Smart Notes’** is intended for every Maharashtra State Board aspirant of Std. XII, Commerce. The scope, sequence, and level of the book are designed to match the new textbook issued by the Maharashtra State Board.

At this crucial juncture in their lives, when the students are grappling with the pressures of cracking a career-defining board examination, we wanted to create a book that not only develops the necessary knowledge, tools and skills required to excel in the examination, but also enables students to appreciate the beauty of the subject and piques their curiosity.

We believe that students respond favourably to meaningful content, if it is presented in a way that is easy to read and understand, rather than being mired down with facts and information. Consequently, we have always placed the highest priority on writing clear and lucid explanations of fundamental concepts. Moreover, special care has been taken to ensure that the topics are presented in a logical order.

The primary purpose of this book is to assist the students in preparing for the board examination. However, this is closely linked to other goals: to exemplify how important and how incredibly interesting mathematics is, and to help the student become an expert thinker and problem solver.

**Practice, practice & more practice is the key to score high in mathematics!**

To help the students, this book amalgamates problems that are rich in both variety and number which provides the student with ample practice, ensuring mastery of each concept.

In addition, the chapter-test have been carefully crafted to focus on concepts, thus providing the students with a quick opportunity for self-assessment and giving them an increased appreciation of chapter-preparedness.

*Our Mathematics & Statistics Part – II ‘Smart Notes’ adheres to our vision and achieves several goals: **building concepts, developing competence to solve problems, recapitulation, self-study, self-assessment and student engagement** — all while encouraging students toward cognitive thinking.*

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we’ve nearly missed something or want to applaud us for our triumphs, we’d love to hear from you.

Please write to us on: [mail@targetpublications.org](mailto:mail@targetpublications.org)

*A book affects eternity; one can never tell where its influence stops.*

*Best of luck to all the aspirants!*

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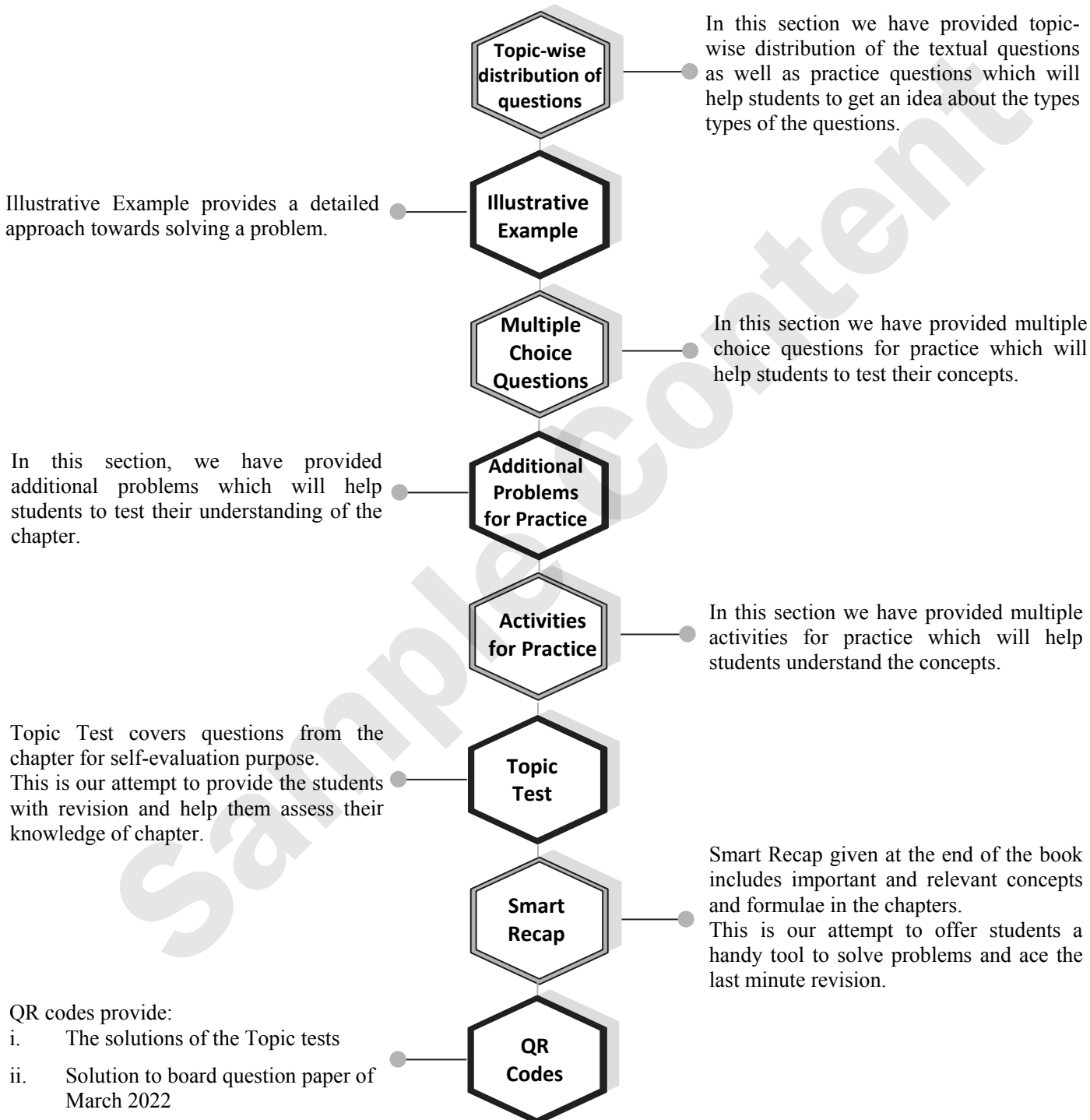
This reference book is transformative work based on textbook Mathematics & Statistics Part - II; First Reprint: 2021 published by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. We the publishers are making this reference book which constitutes as fair use of textual contents which are transformed by adding and elaborating, with a view to simplify the same to enable the students to understand, memorize and reproduce the same in examinations.

This work is purely inspired upon the course work as prescribed by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. Every care has been taken in the publication of this reference book by the Authors while creating the contents. The Authors and the Publishers shall not be responsible for any loss or damages caused to any person on account of errors or omissions which might have crept in or disagreement of any third party on the point of view expressed in the reference book.

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## KEY FEATURES



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## Syllabus

- Commission, Brokerage

- Discount



## Let's Study

**Introduction:**

The commercial and trade transactions are monetary in nature. They involve use of the terms like commission, brokerage, discount etc, which are the core factors influencing these transactions.

**Commission and Brokerage****Commission:**

Commission is the charge/renumeration paid to an agent for doing work (such as sale, purchase, auction etc) on behalf of his principal (the person who hires/takes assistance of the agent).

The commission or the remuneration paid to an agent is generally fixed as some percentage of the value of the transaction.

**For example,**

If an agent charges 5% on the sale value, then on the sale of ₹ 75,000,

$$\begin{aligned} \text{Agent's commission} &= 5\% \text{ of ₹ } 75,000 \\ &= \frac{5}{100} \times 75,000 \\ &= ₹ 3,750 \end{aligned}$$

∴ Agent gets commission of ₹ 3,750 on the sale value of ₹ 75,000.

**Principal**

Principal refers to an individual party or parties participating in the transaction.



### Agent

Business transactions like sale, purchase, auction are done through some middlemen. Such middlemen are called agents.

#### Types of Agents:

##### Commission Agent:

A commission agent is a person who buys or sells goods on behalf of his principal and gets commission in return for his work.

##### Broker:

A broker is an agent who brings together the buyer and the seller for the purpose of purchase or sale. This commission is called **brokerage** and is charged to both the parties.

##### Auctioneer:

An auctioneer is an agent engaged in the task of selling goods by auction. Auctioneer often keeps the name of his/her principal a secret and sells the goods to the highest bidder.

##### Factor:

A factor is an agent who is given the possession of goods and enters into contract for sale in his/her own name.

##### Del Credere Agent:

A del credere agent gives guarantee/undertaking to his principal that the party to whom he/she sells the goods will pay the sale price of goods. For this he/she gets additional commission (known as the del credere commission) over and above the usual commission on the sale value of goods.

### Discount

It is the reduction on the price of the goods allowed by the seller to the purchaser. It is expressed as a percentage.

#### Types of Discount:

##### i. Trade discount:

Trade discount is allowed by one trader to another. It is allowed on the catalogue price or the list price of goods.

##### ii. Cash discount:

It is allowed only in case of ready cash payment or payment before the due date.

If both the discounts are allowed, then trade discount is first calculated on list price and cash discount is calculated on price obtained by deducting trade discount from list price.

$$\therefore \text{Invoice Price} = \text{List Price (Catalogue Price)} \\ - \text{Trade Discount}$$

$$\text{Selling Price / Net Selling Price}$$

$$= \text{Invoice Price} - \text{Cash Discount}$$

$$\text{Profit} = \text{Net Price} - \text{Cost Price}$$

$$\text{Loss} = \text{Cost Price} - \text{Net Price}$$



### Exercise 1.1

1. An agent charges 12% commission on the sales. What does he earn if the total sale amounts to ₹ 48,000? What does the seller get?

#### Solution:

Agent earns commission at 12% on the sales.

$$\therefore \text{Commission to agent} = \text{Sales} \times \text{Rate of commission} \\ = 48,000 \times \frac{12}{100} \\ = ₹ 5,760$$

Net amount received by seller

$$= \text{Sales} - \text{Commission}$$

$$= 48,000 - 5,760$$

$$= ₹ 42,240$$

- ∴ Salesman earns ₹ 5,760 as commission and amount received by seller is ₹ 42,240.

2. A salesman receives 3% commission on the sales up to ₹ 50,000 and 4% commission on the sales over ₹ 50,000. Find his total income on the sale of ₹ 2,00,000.

#### Solution:

Salesman earns 3% commission on the sales upto ₹ 50,000 and 4% commission on the sales over ₹ 50,000.

His total sales is ₹ 2,00,000.

- ∴ Commission on sales upto ₹ 50,000

$$= 50,000 \times \frac{3}{100}$$

$$= ₹ 1,500$$

Commission on sales over ₹ 50,000

$$= (2,00,000 - 50,000) \times \frac{4}{100}$$

$$= 1,50,000 \times \frac{4}{100}$$

$$= ₹ 6,000$$

$$\text{Total commission} = 1,500 + 6,000 = ₹ 7,500$$

- ∴ Total income on the sale of ₹ 2,00,000 is ₹ 7,500.

3. Ms. Saraswati was paid ₹ 88,000 as commission on the sale of computers at the rate of 12.5%. If the price of each computer was ₹ 32,000, how many computers did she sell?

#### Solution:

Price of a computer = ₹ 32,000

Rate of commission = 12.5%

Commission for one computer

$$= 32,000 \times 12.5\%$$

$$= ₹ 4,000$$

Total commission earned is ₹ 88,000.

Number of total computers sold



$$= \frac{\text{Total Commission}}{\text{Commission per Computer}}$$

$$= \frac{88,000}{4,000}$$

$$= 22$$

∴ 22 Computers were sold to get a total commission of ₹ 88,000.

4. Anita is allowed 6.5% commission on the total sales made by her, plus a bonus of  $\frac{1}{2}\%$  on the sale over ₹ 20,000. If her total commission amounts to ₹ 3,400, find the sales made by her.

**Solution:**

Let total sales made by Anita be 'x'.  
Rate of commission on total sales is 6.5%.  
Commission earned = Total sales

$$\times \text{Rate of commission}$$

$$= x \times \frac{6.5}{100} = \frac{6.5x}{100}$$

Sales above ₹ 20,000 = (x - 20,000)

On sales above ₹ 20,000, she gets  $\frac{1}{2}\%$  bonus.

$$\therefore \text{Commission earned} = (x - 20,000) \times \frac{0.5}{100}$$

$$= \frac{(0.5x - 10,000)}{100}$$

Total commission earned is ₹ 3,400.

Total commission =  $\frac{\text{Commission}}{\text{on total sales}} + \frac{\text{Bonus}}{\text{on sales}}$

$$\therefore 3,400 = \frac{6.5x}{100} + \frac{(0.5x - 10,000)}{100}$$

$$\therefore 3,400 = \frac{6.5x + 0.5x - 10,000}{100}$$

$$\therefore 3,40,000 = 7x - 10,000$$

$$\therefore 3,40,000 + 10,000 = 7x$$

$$\therefore 3,50,000 = 7x$$

$$\therefore x = 50,000$$

∴ Total sales made by Anita is ₹ 50,000.

5. Priya gets salary of ₹ 15,000 per month and commission at 8% on the sales over ₹ 50,000. If she gets ₹ 17,400 in a certain month, find the sales made by her in that month.

**Solution:**

Priya gets a salary of ₹ 15,000 per month and 8% on the sales over ₹ 50,000.

Let the total sales be ₹ 'x'.

$$\therefore \text{Commission earned} = (x - 50,000) \times \frac{8}{100}$$

She has earned ₹ 17,400 in certain month.

$$\therefore \text{Total income} = \frac{\text{Salary per}}{\text{month}} + \frac{\text{Commission on}}{\text{sale}}$$

$$17,400 = 15,000 + (x - 50,000) \times \frac{8}{100}$$

$$17,400 = 15,000 + \frac{8x - 4,00,000}{100}$$

$$17,400 = \frac{15,00,000 + 8x - 4,00,000}{100}$$

$$17,400 \times 100 = 15,00,000 + 8x - 4,00,000$$

$$17,40,000 = 11,00,000 + 8x$$

$$8x = 17,40,000 - 11,00,000$$

$$8x = 6,40,000$$

$$\therefore x = 80,000$$

∴ Priya made sales of ₹ 80,000 in that month.

6. The income of a broker remains unchanged though the rate of commission is increased from 4% to 5%. Find the percentage reduction in the value of the business.

**Solution:**

Let the initial value of the business be ₹ 100.  
Original rate of commission = 4%.

$$\therefore \text{Original income of the agent} = 100 \times \frac{4}{100} = ₹ 4$$

Let the new value of the business be ₹ x

New rate of commission = 5%

$$\therefore \text{New income of the agent} = x \times \frac{5}{100} = \frac{5x}{100}$$

However, it is given that original income and new income of agent is same.

$$\therefore 4 = \frac{5x}{100}$$

$$\therefore 5x = 400$$

$$\therefore x = 80$$

∴ New value of business is ₹ 80.

Reduction in business

$$= \frac{\text{Old value} - \text{New value}}{\text{Old value}} \times 100$$

$$= \frac{100 - 80}{100} \times 100$$

$$= 20\%$$

There is 20% reduction in the value of the business.

7. Mr. Pavan is paid a fixed weekly salary plus commission based on percentage of sales made by him. If on the sale of ₹ 68,000 and ₹ 73,000 in two successive weeks, he received in all ₹ 9,880 and ₹ 10,180, find his weekly salary and the rate of commission paid to him.

**Solution:**

Income of Pavan = Salary + Commission on sales

∴ For first week, his income is,

$$9,880 = \text{Salary} + \text{Commission on } 68,000 \quad \dots(i)$$

∴ For second week his income is,

$$10,180 = \text{Salary} + \text{commission on } 73,000 \quad \dots(ii)$$





- Subtracting (i) from (ii) we get,  
 Salary + Commission on 73,000 = 10,180  
 (-) Salary + Commission on 68,000 = 9,880  
 (-) (-) (-)
- 
- Commission on 5,000 = 300  
 $\therefore$  On sales of ₹ 5,000, commission is ₹ 300.  
 Commission = Sales  $\times$  Rate of commission  
 $\therefore$  300 = 5,000  $\times$  Rate of commission  
 $\therefore$  Rate of commission =  $\frac{300}{5,000} \times 100 = 6\%$   
 $\therefore$  Commission on sales of ₹ 68,000 at the rate of 6% =  $68,000 \times \frac{6}{100} = ₹ 4,080$   
 $\therefore$  Substituting ₹ 4,080 in equation (i),  
 Salary + Commission on 68,000 = 9,880  
 Salary + 4,080 = 9,880  
 $\therefore$  Salary = 9,880 - 4,080 = ₹ 5,800  
 $\therefore$  Weekly salary of Pavan is ₹ 5,800 and rate of commission is 6%.

8. Deepak's salary was increased from ₹ 4,000 to ₹ 5,000. The sales being the same, due to reduction in the rate of commission from 3% to 2%, his income remained unchanged. Find his sales.

**Solution:**

Let the sales made by Deepak be 'x'.

Existing Salary received is ₹ 4,000

Rate of commission is 3%

- $\therefore$  Initial income of Deepak  
 = Salary + Commission on sales  
 = 4,000 + 3% on x  
 = 4,000 +  $\frac{3x}{100}$  ... (i)

Salary was increased to ₹ 5,000 and rate of commission decreased to 2%. However, sales was still the same.

- $\therefore$  New income of Deepak  
 = Salary + Commission on sales  
 = 5,000 + 2% on x  
 = 5,000 +  $\frac{2x}{100}$  ... (ii)

It is given that the income of Deepak remained unchanged.

- $\therefore$   $4,000 + \frac{3x}{100} = 5,000 + \frac{2x}{100}$   
 ... [From (i) and (ii)]

$$\therefore \frac{4,00,000 + 3x}{100} = \frac{5,00,000 + 2x}{100}$$

$$\therefore 4,00,000 + 3x = 5,00,000 + 2x$$

$$\therefore 3x - 2x = 5,00,000 - 4,00,000$$

$$\therefore x = 1,00,000$$

$$\therefore \text{Sales made by Deepak is ₹ 1,00,000.}$$

9. An agent is paid a commission of 7% on cash sales and 5% on credit sales made by him. If on the sale of ₹ 1,02,000 the agent claims a total commission of ₹ 6,420, find his cash sales and credit sales.

**Solution:**

Let the cash sales made by agent be x

Total sales of agent is ₹ 1,02,000

- $\therefore$  Credit sales = 1,02,000 - x  
 Rate of commission on cash sales = 7%  
 Rate of commission on credit sales = 5%  
 $\therefore$  Total commission = Commission on cash sales + Commission on credit sales  
 $\therefore$  6,420 =  $x \times \frac{7}{100} + (1,02,000 - x) \times \frac{5}{100}$   
 $\therefore$   $6,420 = \frac{7x}{100} + \frac{5,10,000 - 5x}{100}$   
 $\therefore$   $6,420 = \frac{7x + 5,10,000 - 5x}{100}$   
 $\therefore$   $6,420 \times 100 = 2x + 5,10,000$   
 $\therefore$   $6,42,000 = 2x + 5,10,000$   
 $\therefore$   $2x = 6,42,000 - 5,10,000$   
 $\therefore$   $2x = 1,32,000$   
 $\therefore$   $x = 66,000$   
 $\therefore$  Cash sales = ₹ 66,000  
 Credit sales = 1,02,000 - x  
 = 1,02,000 - 66,000  
 = ₹ 36,000  
 $\therefore$  Cash sales made by agent is ₹ 66,000 and credit sales is ₹ 36,000.

10. Three cars were sold through an agent for ₹ 2,40,000, ₹ 2,22,000 and ₹ 2,25,000 respectively. The rates of commission were 17.5% on the first, 12.5% on the second. If the agent overall received 14% commission on the total sales, find the rate of commission paid on the third car.

**Solution:**

Three cars were sold by agent for ₹ 2,40,000, ₹ 2,22,000 and ₹ 2,25,000 respectively.

Rates of commission for first and second car were 17.5% and 12.5% respectively.

Overall commission received after sales of three cars is 14%.

- $\therefore$  Total commission = 14% on Total Sales  
 =  $\frac{14}{100} \times (2,40,000 + 2,22,000 + 2,25,000)$   
 =  $\frac{14}{100} \times 6,87,000$   
 = ₹ 96,180 ... (i)  
 Commission on first car = 2,40,000  $\times$   $\frac{17.5}{100}$   
 = ₹ 42,000 ... (ii)



$$\begin{aligned} \text{Commission on second car} &= 2,22,000 \times \frac{12.5}{100} \\ &= ₹ 27,750 \quad \dots(\text{iii}) \end{aligned}$$

Let rate of commission on third car be  $x\%$ .

$$\text{Commission on third car} = 2,25,000 \times \frac{x}{100} \quad \dots(\text{iv})$$

$$\begin{aligned} \text{Total commission} &= \text{Commission on first car} + \text{Commission on second car} \\ &\quad + \text{Commission on third car} \end{aligned}$$

$\therefore$  From (i), (ii), (iii) and (iv),

$$96,180 = 42,000 + 27,750 + 2,25,000 \times \frac{x}{100}$$

$$\therefore 96,180 = 69,750 + 2,25,000 \times \frac{x}{100}$$

$$\therefore 2,25,000 \times \frac{x}{100} = 96,180 - 69,750$$

$$\therefore 2,25,000 \times \frac{x}{100} = 26,430$$

$$\therefore x = \frac{26,430 \times 100}{2,25,000}$$

$$\therefore x = 11.75\%$$

$\therefore$  Rate of commission on third car is 11.75%.

- 11. Swatantra Distributers allows 15% discount on the list price of washing machine. Further 5% discount is given for cash payment. Find the list price of the washing machine if it was sold for the net amount of ₹ 38,356.25.**

**Solution:**

Let the list price be ' $x$ '

Swatantra Distributers gives 15% discount on list price.

$$\therefore \text{Discount} = x \times \frac{15}{100} = 0.15x$$

$$\therefore \text{Net price} = x - 0.15x = 0.85x$$

Further cash discount is given at 5%.

$$\therefore \text{Cash discount} = 0.85x \times \frac{5}{100} = 0.0425x$$

$$\therefore \text{Net selling price} = 0.85x - 0.0425x = 0.8075x$$

However, net selling price is ₹ 38,356.25.

$$\therefore 0.8075x = 38,356.25$$

$$\therefore x = \frac{38,356.25}{0.8075}$$

$$\therefore x = ₹ 47,500$$

$\therefore$  List price of washing machine is ₹ 47,500.

- 12. A book seller received ₹ 1,530 as 15% commission on list price. Find list price of the books.**

**Solution:**

Let the list price of books be  $x$ .

A book seller received ₹ 1,530 as 15% commission on list price.

$$\begin{aligned} \text{Commission earned} &= \text{List price} \times \text{Rate of commission} \end{aligned}$$

$$\therefore 1,530 = x \times \frac{15}{100}$$

$$\therefore x = \frac{1,530 \times 100}{15}$$

$$\therefore x = 10,200$$

$\therefore$  List price of the books is ₹ 10,200.

- 13. A retailer sold a suit for ₹ 8,832 after allowing 8% discount on marked price and further 4% cash discount. If he made 38% profit, find the cost price and the marked price of the suit.**

**Solution:**

Let the marked price of the suit be ' $x$ '.

Seller allows discount of 8% on marked price.

$$\therefore \text{Discount} = x \times \frac{8}{100} = 0.08x$$

$$\therefore \text{Net price} = x - 0.08x = 0.92x$$

Further cash discount of 4% is given.

$$\therefore \text{Cash discount} = 0.92x \times \frac{4}{100} = 0.0368x$$

$$\therefore \text{Net selling price} = 0.92x - 0.0368x = 0.8832x$$

However, net selling price is given as ₹ 8,832.

$$\therefore 0.8832x = 8,832$$

$$\therefore x = \frac{8,832}{0.8832}$$

$$\therefore x = ₹ 10,000$$

$\therefore$  Marked price (list price) is ₹ 10,000.

Retailer has made 38% profit on cost price.

Let the cost price be  $y$ .

$$\text{Profit} = y \times \frac{38}{100} = \frac{38y}{100}$$

Cost price + Profit = Selling price

$$\therefore y + \frac{38y}{100} = 8,832$$

$$\therefore \frac{100y + 38y}{100} = 8,832$$

$$\therefore \frac{138y}{100} = 8,832$$

$$\therefore y = \frac{8,832 \times 100}{138} = ₹ 6,400$$

$\therefore$  The cost price of the suit is ₹ 6,400 and list price (marked price) is ₹ 10,000.

- 14. An agent charges 10% commission plus 2% delcredere. If he sells goods worth ₹ 37,200, find his total earnings.**

**Solution:**

An agent sells goods worth ₹ 37,200 and earns commission of 10% plus 2% delcredere commission.



$$\begin{aligned}\text{Commission earned} &= \text{Sale value} \times \text{Rate of commission} \\ &= 37,200 \times \frac{10}{100} \\ &= ₹ 3,720 \quad \dots(i)\end{aligned}$$

$$\begin{aligned}\text{Delcreder commission earned} &= \text{Sale value} \times \text{Rate of commission} \\ &= 37,200 \times \frac{2}{100} \\ &= ₹ 744 \quad \dots(ii)\end{aligned}$$

$$\begin{aligned}\therefore \text{Total commission earned} &= 3,720 + 744 \\ &\quad \dots[\text{from (i) and (ii)}] \\ &= ₹ 4,464\end{aligned}$$

$$\therefore \text{Agent's total earnings is ₹ 4,464.}$$

15. A whole seller allows 25% trade discount and 5% cash discount. What will be the net price of an article marked at ₹ 1,600?

**Solution:**

The article is marked at ₹ 1,600 i.e. its list price is ₹ 1,600.

Wholesaler allows 25% trade discount.

$$\begin{aligned}\therefore \text{Trade discount} &= 25\% \text{ of List price} \\ &= 25\% \text{ of ₹ 1,600} \\ &= \frac{25}{100} \times 1,600 = ₹ 400\end{aligned}$$

$$\begin{aligned}\text{Invoice Price} &= \text{List price} - \text{Trade discount} \\ &= 1,600 - 400 = ₹ 1,200\end{aligned}$$

Also, the wholesaler allows 5% cash discount

$$\begin{aligned}\therefore \text{Cash discount} &= 5\% \text{ of invoice price} \\ &= 5\% \text{ of ₹ 1,200} \\ &= \frac{5}{100} \times 1,200 = ₹ 60\end{aligned}$$

$$\begin{aligned}\therefore \text{Net price} &= \text{Invoice price} - \text{Cash discount} \\ &= 1,200 - 60\end{aligned}$$

$$\therefore \text{Net price} = ₹ 1,140$$

$$\therefore \text{Net price of the article is ₹ 1,140.}$$



Let's Study

Discount

1. **Present Worth, Sum Due, True Discount:**

Though most of the transactions involved in business are monetary in nature, however sometimes it is required to be done on credit basis.

In such a case, sufficient margin of interest is included on the quoted price of goods and it depends on the period of credit allowed.

**For example:**

Suppose goods are worth ₹ 900, if the payment is made on the spot. However, if a credit of 8 months is allowed, then the businessmen will

quote the price by adding interest for 8 months to ₹ 900. If rate of interest is 6% per annum then the interest for 8 months is

$$\text{Interest} = \frac{900 \times \frac{8}{12} \times 6}{100} = \frac{900 \times 8 \times 6}{12 \times 100} = ₹ 36$$

∴ The customer has to pay ₹ (900 + 36) = ₹ 936 after 8 months.

∴ ₹ 936 due after 8 months at 6% p.a. is equivalent to ₹ 900 today.

Now, ₹ 900 is known as present worth (P.W.), ₹ 936 is known as sum due (S.D.) and ₹ 36 is known as true discount (T.D.)

∴ Sum Due = Present Worth + True Discount  
i.e., S.D. = P.W. + T.D.

Also, true discount is the interest on the present worth at the given rate of interest for the given period.

$$\text{i.e., T.D.} = \frac{\text{P.W.} \times n \times r}{100}$$

Where, n = period of the bill in years

r = rate of interest per annum

Whenever the goods are sold on credit a bill is drawn by the seller on the buyer to pay the credit amount of the goods on SD.

**Various terms involved in the bill are as follows:**

**Drawer:** A person who draws the bill is called the drawer.

**Drawee:** A person on whom the bill is drawn is called the drawee.

**Date of bill:** The date on which the bill is drawn is called date of bill.

**Face value:** The amount for which the bill is drawn is called face value (F.V.) of the bill.

**Period:** Period of the bill is the time after expiry of which the drawer receives the payment.

**Nominal Due Date:** The date on which the period of the bill expires is called the nominal due date. The buyer has to make the payment to the seller on this date.

**Legal Due Date:** The date obtained after adding 3 days to the nominal due date is known as the legal due date. These 3 days are called the days of grace.

**Discounting a Bill:** If the drawer of the bill wants money before the legal due date, then there is a facility available with a bank or an agent who can discount a bill and pay the amount to the drawer. (Not equal to the face value of the bill). This is called discounting the bill.



## 2. Banker's Discount, Cash Value, Banker's Gain:

When a bill is discounted in a bank, the banker will deduct interest on the face value (sum due) of the bill at the given rate of interest for the period from the date of discounting to the legal due date and pay the balance to the drawer. This interest is known as the Banker's Discount (B.D.)

The banker's discount is also called Commercial Discount.

B.D. = Interest on face value (F.V.) for  $n$  years at  $r\%$

$$\text{i.e., B.D.} = \frac{\text{F.V.} \times n \times r}{100}$$

### Cash Value:

The amount paid to the holder after deducting banker's discount is known as the Cash Value (C.V.) of the bill on the date of discounting.

i.e., Cash value = Face value – Banker's discount

$$\text{i.e., C.V.} = \text{F.V.} - \text{B.D.}$$

### Banker's Gain:

The difference between the banker's discount and the true discount is called Banker's Gain (B.G.)

i.e., Banker's Gain = Banker's discount – True discount

$$\text{i.e., B.G.} = \text{B.D.} - \text{T.D.}$$

Also, it is equal to the interest on true discount.

$$\text{i.e., B.G.} = \frac{\text{T.D.} \times n \times r}{100}$$

### Note:

- True discount is calculated on the present worth.
- The banker's discount is calculated on the face value (sum due).
- The banker's discount is always higher than the true discount.
- The banker's gain is calculated on the true discount.
- Face value is also called as sum due.

### List of Formulas:

- $\text{S.D.} = \text{P.W.} + \text{T.D.}$
- $\text{T.D.} = \frac{\text{P.W.} \times n \times r}{100}$
- $\text{B.D.} = \frac{\text{F.V.} \times n \times r}{100}$
- $\text{B.G.} = \text{B.D.} - \text{T.D.}$
- $\text{B.G.} = \frac{\text{T.D.} \times n \times r}{100}$
- Cash value = S.D. – B.D.



## Exercise 1.2

- What is the present worth of a sum of ₹ 10,920 due six months hence at 8% p.a. simple interest?

**Solution:**

$$\text{Sum due} = ₹ 10,920, \text{ Period } (n) = \frac{6}{12} \text{ years,}$$

$$r = 8\% \text{ p.a.}$$

To find P.W.

$$\text{S.D.} = \text{P.W.} + \text{T.D.} \quad \dots(i)$$

$$\therefore \text{S.D.} = \text{P.W.} + \left( \frac{\text{P.W.} \times n \times r}{100} \right)$$

$$\therefore \text{S.D.} = \text{P.W.} \left( 1 + \frac{n \times r}{100} \right)$$

$$\therefore 10,920 = \text{P.W.} \left( 1 + \frac{\frac{6}{12} \times 8}{100} \times 8 \right)$$

$$\therefore 10,920 = \text{P.W.} \left( 1 + \frac{4}{100} \right)$$

$$\therefore 10,920 = \text{P.W.} \left( \frac{100 + 4}{100} \right)$$

$$\therefore 10,920 = \text{P.W.} \left( \frac{104}{100} \right)$$

$$\therefore \text{P.W.} = \frac{10,920 \times 100}{104}$$

$$\therefore \text{P.W.} = 10,500$$

$\therefore$  Present worth of a sum of ₹ 10,920 due six month at 8% p.a. simple interest is ₹ 10,500.

- What is sum due of ₹ 8,000 due 4 months hence at 12.5% simple interest?

**Solution:**

$$\text{Present worth (P.W.)} = ₹ 8,000$$

$$\text{Period } (n) = \frac{4}{12} \text{ years}$$

$$r = 12.5\%$$

$$\begin{aligned} \text{T.D.} &= \frac{\text{P.W.} \times n \times r}{100} \\ &= \frac{8,000 \times \frac{4}{12} \times 12.5}{100} \end{aligned}$$

$$= \frac{8,000 \times 4.17}{100}$$

$$= ₹ 333$$

$$\begin{aligned} \text{Sum due (S.D.)} &= \text{P.W.} + \text{T.D.} \\ &= 8,000 + 333 \\ &= 8,333 \end{aligned}$$

$\therefore$  Sum due is ₹ 8,333.



3. True discount on the sum due 8 months hence at 12% p.a. is ₹ 560. Find the sum due and present worth of the bill.

**Solution:**

$$\text{True discount (T.D.)} = ₹ 560$$

$$\text{Period (n)} = \frac{8}{12} \text{ year}$$

$$r = 12\%$$

To find Present Worth (P.W.)

$$\text{T.D.} = \frac{\text{P.W.} \times n \times r}{100}$$

$$560 = \frac{\text{P.W.} \times \frac{8}{12} \times 12}{100}$$

$$560 = \frac{\text{P.W.} \times 8}{100}$$

$$\text{P.W.} = \frac{560 \times 100}{8}$$

$$\text{P.W.} = 7,000$$

To find sum due

$$\text{S.D.} = \text{P.W.} + \text{T.D.}$$

$$= 7,000 + 560$$

$$= 7,560$$

- ∴ Present worth is ₹ 7,000 and sum due is ₹ 7,560.

4. The true discount on a sum is  $\frac{3}{8}$  of the sum due at 12% p.a. Find the period of the bill.

**Solution:**

$$\text{Given, T.D.} = \frac{3}{8} \times \text{S.D.}$$

$$\therefore \text{T.D.} = \frac{3}{8} \times (\text{P.W.} + \text{T.D.})$$

$$\therefore \frac{8}{3} \text{T.D.} = \text{P.W.} + \text{T.D.}$$

$$\therefore \text{P.W.} = \frac{8}{3} \text{T.D.} - \text{T.D.}$$

$$\therefore \text{P.W.} = \frac{5}{3} \text{T.D.}$$

$$\text{Also, T.D.} = \frac{\text{P.W.} \times n \times r}{100}$$

$$\therefore \text{T.D.} = \frac{\frac{5}{3} \text{T.D.} \times n \times 12}{100}$$

$$\therefore \text{T.D.} = \frac{5 \text{T.D.} \times n \times 12}{3 \times 100}$$

$$\therefore n = \frac{\text{T.D.} \times 3 \times 100}{5 \text{T.D.} \times 12}$$

$$\therefore n = 5 \text{ years}$$

- ∴ Period of the bill is 5 years.

5. 20 copies of a book can be purchased for a certain sum payable at the end of 6 months and 21 copies for the same sum in ready cash. Find the rate of interest.

**Solution:**

Let the price of one book be ₹  $x$ .

Now, 20 copies of the book are purchased for a certain sum due at the end of 6 months.

$$\therefore \text{P.W. of 20 books} = 20x,$$

$$n = \frac{6}{12} = \frac{1}{2} \text{ year}$$

Since, S.D. = P.W. + T.D.

$$\therefore \text{S.D.} = \text{P.W.} + \left( \frac{\text{P.W.} \times n \times r}{100} \right)$$

$$\therefore \text{S.D.} = 20x + \frac{20x \times \frac{1}{2} \times r}{100}$$

$$\therefore \text{S.D.} = \frac{2,000x + 10xr}{100}$$

Also, 21 copies of the book are purchased for the same sum but in ready cash.

$$\therefore \text{S.D. of 20 books} = \text{cost of 21 copies in ready cash}$$

$$\therefore \frac{2,000x + 10xr}{100} = 21x$$

$$\therefore \frac{(2,000 + 10r)x}{100} = 21x$$

$$\therefore \frac{2,000 + 10r}{100} = 21$$

$$\therefore 2,000 + 10r = 21 \times 100$$

$$\therefore 10r = 2,100 - 2,000$$

$$\therefore 10r = 100$$

$$\therefore r = \frac{100}{10}$$

$$\therefore r = 10\%$$

- ∴ Rate of interest is 10% p.a.

6. Find the true discount, banker's discount and banker's gain on a bill of ₹ 4,240 due 6 months hence at 9% p.a.

**Solution:**

Given, S.D. = ₹ 4,240,

$$n = \frac{6}{12} = \frac{1}{2} \text{ year, } r = 9\% \text{ p.a.}$$

$$\text{Since, B.D.} = \frac{\text{S.D.} \times n \times r}{100}$$

$$\therefore \text{B.D.} = \frac{4,240 \times \frac{1}{2} \times 9}{100} = \frac{4,240 \times 9}{100 \times 2}$$

$$\therefore \text{B.D.} = ₹ 190.80$$

Let true discount be ₹  $x$

Now, B.D. = T.D. + Interest on T.D. for  $\frac{1}{2}$  year

at 9% p.a.



$$\begin{aligned} \therefore 190.80 &= x + \left( x \times \frac{1}{2} \times \frac{9}{100} \right) \\ \therefore 190.80 &= x + \frac{9x}{200} \\ \therefore 190.80 &= \frac{209x}{200} \\ \therefore x &= \frac{190.80 \times 200}{209} \\ \therefore x &= ₹ 182.58 \\ \therefore \text{T.D.} &= ₹ 182.58 \approx ₹ 182.60 \\ \text{Also, B.G.} &= \text{B.D.} - \text{T.D.} = 190.8 - 182.58 \\ \therefore \text{B.G.} &= ₹ 8.22 \approx ₹ 8.20 \\ \therefore \text{True discount, banker's discount and banker's} & \\ \text{gain are ₹ 182.60, ₹ 190.80 and ₹ 8.20} & \\ \text{respectively.} & \end{aligned}$$

7. True discount on a bill is ₹ 2,200 and bankers discount is ₹ 2,310. If the bill is due 10 months, hence, find the rate of interest.

**Solution:**

Given, T.D. = ₹ 2,200, B.D. = ₹ 2,310

$$n = \frac{10}{12} = \frac{5}{6} \text{ year}$$

B.D. = T.D. + Interest on T.D.

$$\therefore 2,310 = 2,200 + \frac{2,200 \times 5 \times r}{6}$$

$$\therefore 2,310 - 2,200 = \frac{2,200 \times 5 \times r}{6}$$

$$\therefore r = \frac{110 \times 6}{2,200 \times 5}$$

$$\therefore r = 6\%$$

$\therefore$  The rate of interest is 6% p.a.

8. A bill of ₹ 6,935 drawn on 19<sup>th</sup> January 2015 for 8 months was discounted on 28<sup>th</sup> February 2015 at 8% p.a. interest. What is the banker's discount? What is the cash value of the bill?

**Solution:**

Given, Face Value of bill = ₹ 6,935

$r = 8\%$

Date of drawing = 19<sup>th</sup> January, 2015

Period of bill = 8 months

Nominal due date = 19<sup>th</sup> September, 2015

Legal due date = 22<sup>nd</sup> September, 2015

Date of discounting = 28<sup>th</sup> February, 2015

$\therefore$  Number of days from date of discounting to legal due date:

Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
0	31	30	31	30	31	31	22	206

$$\text{Period} = \frac{206}{365}$$

B.D. = Interest on F.V. for 206 days at 8% p.a.

$$\therefore \text{B.D.} = \frac{6,935 \times 206 \times 8}{365 \times 100}$$

$$\therefore \text{B.D.} = ₹ 313.12$$

$$\begin{aligned} \text{Cash value} &= \text{Face Value} - \text{Banker's discount} \\ &= 6,935 - 313.12 \\ &= ₹ 6,621.88 \end{aligned}$$

$\therefore$  Banker's discount is ₹ 313.12 and Cash value of the bill is ₹ 6,621.88.

9. A bill of ₹ 8,000 drawn on 5<sup>th</sup> January 1998 for 8 months was discounted for ₹ 7,680 on a certain date. Find the date on which it was discounted at 10% p.a.

**Solution:**

Face value = ₹ 8,000

Cash value = ₹ 7,680

$$\begin{aligned} \text{Banker discount (B.D.)} &= \text{F.V.} - \text{C.V.} \\ &= 8,000 - 7,680 \\ &= ₹ 320 \end{aligned}$$

Date of drawing = 5<sup>th</sup> January 1998

Period = 8 months

Nominal due date = 5<sup>th</sup> September 1998

Legal due date = 8<sup>th</sup> September 1998

$$\text{B.D.} = \frac{\text{F.V.} \times \frac{n}{365} \times 10}{100}$$

$$\therefore 320 = \frac{8,000 \times \frac{n}{365} \times 10}{100}$$

$$\therefore n = \frac{320 \times 100 \times 365}{8000 \times 10}$$

$$\therefore n = 146 \text{ days}$$

$\therefore$  To calculate date on which bill was discounted, we have to go 146 days behind from legal due date.

April	May	June	July	Aug	Sep	Total
15	31	30	31	31	8	146 days

The date on which bill was discounted is 15<sup>th</sup> April 1998.

10. A bill drawn on 5<sup>th</sup> June for 6 months was discounted at the rate of 5% p.a. on 19<sup>th</sup> October. If the cash value of the bill is ₹ 43,500, find face value of the bill.

**Solution:**

Given, Date of drawing = 5<sup>th</sup> June

Period of the bill = 6 months

$\therefore$  Nominal due date = 5<sup>th</sup> December

Legal due date = 8<sup>th</sup> December

Date of discounting = 19<sup>th</sup> October

Cash value (C.V.) = ₹ 43,500 and  $r = 5\%$



Now, number of days from the date of discounting to the legal due date are as follows:

Oct	Nov	Dec	Total
12	30	8	50

$$\therefore n = \frac{50}{365} = \frac{10}{73} \text{ years}$$

Let F.V. of the bill be  $x$ .

C.V. = F.V. - B.D.

$$43,500 = x - \frac{\text{F.V.} \times n \times r}{100}$$

$$43,500 = x - \frac{x \times \frac{10}{73} \times 5}{100}$$

$$43,500 = x - \frac{x \times 10 \times 5}{73 \times 100}$$

$$43,500 = x \left( 1 - \frac{1}{146} \right)$$

$$43,500 = x \times \frac{145}{146}$$

$$x = 43,500 \times \frac{146}{145}$$

$$x = ₹ 43,800$$

$\therefore$  Face value of the bill is ₹ 43,800.

- 11. A bill was drawn on 14<sup>th</sup> April for ₹ 7,000 and was discounted on 6<sup>th</sup> July at 5% p.a. The Banker paid ₹ 6,930 for the bill. Find period of the bill.**

**Solution:**

Face value (F.V.) = 7,000

Cash value (C.V.) = 6,930

$$\begin{aligned} \text{Banker's discount (B.D.)} &= \text{F.V.} - \text{C.V.} \\ &= 7,000 - 6,930 \\ &= 70 \end{aligned}$$

Date of drawing bill = 14<sup>th</sup> April

Date of discounting bill = 6<sup>th</sup> July

We know that,

$$\text{Banker's discount} = \frac{\text{F.V.} \times \frac{n}{365} \times r}{100}$$

$$\therefore 70 = \frac{7,000 \times \frac{n}{365} \times 5}{100}$$

$$\therefore n = \frac{70 \times 100 \times 365}{7,000 \times 5}$$

$$\therefore n = 73$$

To calculate period of bill, we have to calculate 73 days from date of bill discounting

July	August	September	Total
25	31	17	73 days

$\therefore$  Legal due date = 17<sup>th</sup> September

$\therefore$  Nominal due date = 17 - 3 = 14<sup>th</sup> September

Date of drawing bill = 14<sup>th</sup> April.

$\therefore$  Period of bill from drawing date is of 5 months.

- 12. If difference between true discount and banker's discount on a sum due 4 months hence is ₹ 20. Find true discount, banker's discount and amount of bill, the rate of simple interest charged being 5%p.a.**

**Solution:**

Given, B.D. - T.D. = ₹ 20,

$$n = \frac{4}{12} = \frac{1}{3} \text{ year and } r = 5\% \text{ p.a.}$$

Since, B.G. = B.D. - T.D.

$\therefore$  B.G. = ₹ 20

Let True discount be ₹  $x$

Now, B.G. = Interest on T.D. for

4 months  $\left( \frac{1}{3} \text{ year} \right)$  at 5% p.a.

$$\therefore 20 = x \times \frac{1}{3} \times \frac{5}{100}$$

$$\therefore x = \frac{20 \times 100 \times 3}{5}$$

$$\therefore x = ₹ 1,200$$

$\therefore$  True discount is ₹ 1,200.

B.G. = B.D. - T.D.

$$\therefore 20 = \text{B.D.} - 1,200$$

$$\therefore \text{B.D.} = 20 + 1,200$$

$$\therefore \text{B.D.} = ₹ 1,220$$

$\therefore$  Banker's discount is ₹ 1,220.

Also, B.D. = Interest on F.V. for  $n$  years at  $r$  % p.a.

Let the face value be ₹  $y$

$$\text{i.e., B.D.} = \frac{y \times n \times r}{100}$$

$$\therefore 1,220 = \frac{y \times \frac{1}{3} \times 5}{100}$$

$$\therefore 1,220 \times 100 = y \times \frac{5}{3}$$

$$\therefore y = \frac{1,22,000 \times 3}{5}$$

$$\therefore y = ₹ 73,200$$

$\therefore$  True discount, Banker's discount and Amount of the bill (face value) is ₹ 1,200, ₹ 1,220 and ₹ 73,200 respectively.

- 13. A bill of ₹ 51,000 was drawn on 18<sup>th</sup> February 2010 for 9 months. It was encashed on 28<sup>th</sup> June 2010 at 5% p.a. Calculate the banker's gain and true discount.**

**Solution:**

It is given that,

Face value (F.V.) = ₹ 51,000 which is (S.D.)

Date of drawing = 18<sup>th</sup> February 2010

Date of discounting = 28<sup>th</sup> June 2010

Period of bill = 9 months

Nominal due date = 18<sup>th</sup> November 2010

Legal due date = 21<sup>st</sup> November 2010



Number of days from date of discounting bill to legal due date

June	July	Aug	Sep	Oct	Nov	Total
2	31	31	30	31	21	146 days

Rate = 5% p.a.

We know that,

$$T.D. = \frac{P.W. \times n \times r}{100}$$

$$= \frac{P.W. \times \frac{146}{365} \times 5}{100}$$

$$\therefore T.D. = 0.02 P.W., \quad \dots(i)$$

Since, S.D. = P.W. + T.D.

$$\therefore S.D. = P.W. + 0.02 P.W. \quad \dots[\text{From (i)}]$$

$$\therefore 51,000 = 1.02 P.W.$$

$$\therefore P.W. = \frac{51,000}{1.02}$$

$$\therefore P.W. = 50,000$$

Since T.D. = 0.02 × P.W.

$$= 0.02 \times 50,000$$

$$= ₹ 1,000$$

$$\therefore \text{True discount is ₹ 1,000}$$

$$\text{Banker's gain} = \frac{T.D. \times n \times r}{100}$$

$$= \frac{1,000 \times \frac{146}{365} \times 5}{100}$$

$$= ₹ 20$$

$$\therefore \text{True discount is ₹ 1,000 and Banker's gain is ₹ 20.}$$

**14. A certain sum due 3 months hence is  $\frac{21}{20}$  of the present worth, what is the rate of interest?**

**Solution:**

$$\text{Given, S.D.} = \frac{21}{20} \times P.W., \quad n = \frac{3}{12} = \frac{1}{4} \text{ year}$$

Since, S.D. = P.W. + T.D.

$$\therefore \frac{21}{20} P.W. = P.W. + T.D.$$

$$\therefore \frac{21}{20} P.W. - P.W. = T.D.$$

$$\therefore T.D. = \frac{1}{20} P.W.$$

$$\text{Also, T.D.} = \frac{P.W. \times n \times r}{100}$$

$$\therefore \frac{1}{20} P.W. = \frac{P.W. \times \frac{1}{4} \times r}{100}$$

$$\therefore \frac{1}{20} = \frac{r}{4 \times 100}$$

$$\therefore r = \frac{400}{20} = 20\% \text{ p.a.}$$

$$\therefore \text{Rate of interest is } 20\% \text{ p.a.}$$

**15. A bill of a certain sum drawn on 28<sup>th</sup> February 2007 for 8 months was encashed on 26<sup>th</sup> March 2007 for ₹ 10,992 at 14% p.a. Find the face value of the bill.**

**Solution:**

We know that,

Banker's discount (B.D.)

$$= \text{face value} - \text{cash value}$$

$$\therefore B.D. = F.V. - 10,992 \quad \dots(i)$$

Date of bill drawn = 28<sup>th</sup> February 2007

Date of bill discounting = 26<sup>th</sup> March 2007

Period of bill = 8 months

Nominal due date = 28<sup>th</sup> October 2007

Legal due date = 31<sup>st</sup> October 2007

Number of days from date of bill discounting to legal due date

Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
5	30	31	30	31	31	30	31	219 days

$$\therefore n = \frac{219}{365} = \frac{3}{5}$$

Since,

$$\text{Banker's discount} = \frac{F.V. \times n \times r}{100}$$

$$\therefore F.V. - 10,992 = \frac{F.V. \times \frac{3}{5} \times 14}{100} \quad \dots[\text{From (i)}]$$

$$\therefore F.V. - 10,992 = \frac{F.V. \times 3 \times 14}{100 \times 5}$$

$$\therefore F.V. - \frac{42F.V.}{500} = 10,992$$

$$\therefore \frac{500F.V. - 42F.V.}{500} = 10,992$$

$$\therefore \frac{458F.V.}{500} = 10,992$$

$$\therefore F.V. = 10,992 \times \frac{500}{458}$$

$$\therefore F.V. = 12,000$$

$$\therefore \text{Face value of the bill is ₹ 12,000.}$$





## Miscellaneous Exercise – 1

**I. Choose the correct alternative.**

- An agent who gives guarantee to his principal that the party will pay the sale price of goods is called
  - Auctioneer
  - Del Credere Agent
  - Factor
  - Broker
- An agent who is given the possession of goods to be sold is known as
  - Factor
  - Broker
  - Auctioneer
  - Del Credere Agent
- The date on which the period of the bill expires is called
  - Legal Due Date
  - Grace Date
  - Nominal Due Date
  - Date of Drawing
- The payment date after adding 3 days of grace period is known as
  - The legal due date
  - The nominal due date
  - Days of grace
  - Date of drawing
- The sum due is also called as
  - Face value
  - Present value
  - Cash value
  - True discount
- P is the abbreviation of
  - Face value
  - Present worth
  - Cash value
  - True discount
- Banker's gain is simple interest on
  - Banker's discount
  - Face Value
  - Cash value
  - True discount
- The marked price is also called as
  - Cost price
  - Selling price
  - List price
  - Invoice price
- When only one discount is given then
  - List price = Invoice price
  - Invoice price = Net selling price
  - Invoice price = Cost price
  - Cost price = Net selling price
- The difference between face value and present worth is called
  - Banker's discount
  - True discount
  - Banker's gain
  - Cash value

**Answers:**

- (B)
- (A)
- (C)
- (A)
- (A)
- (B)
- (D)
- (C)
- (B)
- (B)

**II. Fill in the blanks.**

- A person who draws the bill is called \_\_\_\_\_.
- An \_\_\_\_\_ is an agent who sells the goods by auction.
- Trade discount is allowed on the \_\_\_\_\_ price.
- The banker's discount is also called \_\_\_\_\_.
- The banker's discount is always \_\_\_\_\_ than the true discount.
- The difference between the banker's discount and the true discount is called \_\_\_\_\_.
- The date by which the buyer is legally allowed to pay the amount is known as \_\_\_\_\_.
- A \_\_\_\_\_ is an agent who brings together the buyer and the seller.
- If buyer is allowed both trade and cash discounts, \_\_\_\_\_ discount is first calculated on \_\_\_\_\_ price.
- \_\_\_\_\_ = List price (catalogue Price) - Trade Discount.

**Answers:**

- Drawer
- Auctioneer
- Catalogue/list
- Commercial Discount
- higher
- Bankers Gain
- Legal due date
- broker
- Trade, Catalogue/list
- Invoice Price

**III. State whether each of the following is True or False.**

- Broker is an agent who gives a guarantee to seller that the buyer will pay the sale price of goods.
- Cash discount is allowed on list price.
- Trade discount is allowed on catalogue price.
- The buyer is legally allowed 6 days grace period.
- The date on which the period of the bill expires is called the nominal due date.
- The difference between the banker's discount and true discount is called sum due.
- The banker's discount is always lower than the true discount.
- The bankers discount is also called as commercial discount.
- In general cash discount is more than trade discount.
- A person can get both, trade discount and cash discount.

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To see complete chapter buy **Target Notes** or **Target E-Notes**



∴ Agent's total remuneration = Commission from seller + Commission from buyer  
 = 1,500 + 1,000 = ₹ 2,500  
 ∴ Sale value of car is ₹ 50,000 and total remuneration of the agent is ₹ 2,500.

17. An agent is paid a commission of 4% on cash sales and 6% on credit sales made by him. If on the sale of ₹ 51,000 the agent claims a total commission of ₹ 2,700, find the sales made by him for cash and on credit.

**Solution:**

Let  $x$  be the cash sales made by the agent.

∴ Commission on cash sales = 4% of cash sales  
 =  $\frac{4}{100} \times x = \frac{4x}{100}$

Now, Credit sales = Total sales – Cash sales

∴ Credit sales = 51,000 –  $x$   
 Commission on credit sales = 6% of credit sales

$$= \frac{6}{100} \times (51,000 - x)$$

Total commission = Commission on cash sales + Commission on credit sales

$$\therefore 2,700 = \frac{4x}{100} + \frac{6}{100} (51,000 - x)$$

$$\therefore 2,700 = \frac{4x + 3,06,000 - 6x}{100}$$

$$\therefore 2,70,000 = -2x + 3,06,000$$

$$\therefore 2x = 3,06,000 - 2,70,000$$

$$\therefore 2x = 36,000$$

$$\therefore x = ₹ 18,000$$

∴ Cash sales is ₹ 18,000.

Credit sales = 51,000 – 18,000 = ₹ 33,000

∴ Sales made by agent for cash is ₹ 18,000 and on credit is ₹ 33,000.



Activities for Practice

1. (Textbook page no. 14)

The value of the goods sold = ₹  $x$   
 Commission @ 7.5% on first ₹ 10,000 = ₹

Commission @ 5% on the balance

$$₹ (x - 10,000) = \frac{5}{100} \times \text{$$

$$= ₹ \text{$$

An Agent remits ₹ 33,950 to his principal

$$\therefore x - \text{$$

$$\frac{95x}{100} = 33,950 + \text{$$

$$\frac{19x}{\text{$$

$$x = ₹ \text{$$

2. (Textbook page no. 14)

Rate of discount = 15% and  
 Other charges = 2.5% on list price.  
 List price of tricycle in Mumbai = ₹ 600  
 Net Selling price = List Price – Discount + Other charges

$$= 600 - \frac{\text{$$

List price of tricycle in Nashik = ₹ 750  
 Rate of discount = 10%

Net Selling price = List Price – Discount

$$= \text{$$

$$= ₹ 675$$

A merchant bought tricycles from Mumbai and sold it in Nashik and made a profit of ₹ 13,500

$$\therefore \text{Profit per tricycle} = 675 - \text{$$

$$= ₹ 150$$

$$\text{No. of tricycles bought} = \frac{\text{Total Profit}}{\text{Profit per tricycles}}$$

$$= \frac{13500}{\text{$$

$$= \text{$$

3. (Textbook page no. 14)

Cost Price = ₹ 100  
 A manufacturer makes a profit of 30% on cost after allowing 35% discount.

$$\therefore \text{Selling price} = \text{$$

$$= 100 + \frac{30}{100} \times \text{$$

$$= ₹ 130$$

∴ Selling price = List price – Discount

$$\therefore 130 = \text{List price} - \frac{35}{100} \times \text{$$

$$\therefore 130 = \frac{65}{100} \times \text{$$

$$\therefore \text{List price} = \frac{130 \times 100}{\text{$$

$$= ₹ 200$$

Now the cost of production rises by 20%.

$$\therefore \text{New cost price} = 100 + \frac{\text{$$

$$= ₹ 120$$



New cost price = ₹ 120

Rate of discount =  $x\%$

$$\therefore \text{Selling price} = \boxed{\phantom{000}} + \text{profit}$$

$$= 120 + \frac{\boxed{\phantom{00}}}{100} \times 120$$

$$= ₹ 156$$

$$\therefore \text{List price} = \text{Selling price} + \text{Discount}$$

$$\therefore \boxed{\phantom{000}} = \boxed{\phantom{000}} + \frac{x}{100} \times 200$$

$$\therefore 2x = 200 - \boxed{\phantom{000}}$$

$$\therefore 2x = 44$$

$$\therefore x = \boxed{\phantom{00}}$$

$\therefore$  Reduction in the rate of discount

$$= \boxed{\phantom{000}} - 22$$

$$= 13\%$$

4. (Textbook page no. 15)

Face Value (S) = ₹ 4,015,  $r = 8\%$  p.a.

Date of drawing bill = 19<sup>th</sup> January 2018

Period of the bill = 8 months

Nominal Due date =  $\boxed{\phantom{0000}}$

Legal Due date = 22<sup>nd</sup> September 2018

Date of discounting the bill = 28<sup>th</sup> February 2018

Number of days from date of discounting to legal due date

March	April	May	June	July	Aug.	Sept.	Total
31	$\boxed{\phantom{00}}$	$\boxed{\phantom{00}}$	30	$\boxed{\phantom{00}}$	31	$\boxed{\phantom{00}}$	206 days

$$\therefore \text{B.D.} = \frac{s \times n \times r}{100} = 4015 \times \frac{206}{365} \times \frac{8}{100}$$

$$= ₹ 181.30$$

$$\text{C.V.} = 4015 - \boxed{\phantom{0000}}$$

$$= ₹ 3833.70$$

5. (Textbook page no. 15)

Face value (S) = ₹ 7,300,  $r = 12\%$  p.a.

Cash value (C.V.) = ₹ 7,108

$$\therefore \text{B.D.} = S - \boxed{\phantom{0000}} = ₹ 192$$

Date of drawing the bill = 7<sup>th</sup> June 2017

Date of discounting the bill = 22<sup>nd</sup> October 2017

Number of days from date of discounting to legal due date =  $x$

$$\therefore \text{B.D.} = \frac{\text{S.D.} \times n \times r}{100}$$

$$\therefore \boxed{\phantom{0000}} = \boxed{\phantom{0000}} \times \frac{x}{\boxed{\phantom{00}}} \times \frac{12}{100}$$

$$\therefore x = \boxed{\phantom{000}} \text{ days}$$

$\therefore$  Legal due date is 80 days after the date of discounting the bill.

Oct.	Nov.	Dec.	Jan.	Total
$\boxed{\phantom{00}}$	30	$\boxed{\phantom{00}}$	$\boxed{\phantom{00}}$	80

$\therefore$  Legal due date = 10<sup>th</sup> Jan.  $\boxed{\phantom{0000}}$

Nominal due date = 7<sup>th</sup> Jan.  $\boxed{\phantom{0000}}$

$\therefore$  Period of the bill =  $\boxed{\phantom{0000}}$  months

6. A salesman receives 4 % commission on the sales up to ₹ 10,000 and 5% commission on the sales over ₹ 10,000. Find his total income on the sale of ₹ 35,000 by filling in the given boxes.

**Solution:**

The salesman receives 4% commission on the sales upto ₹ 10,000.

$\therefore$  Salesman's commission on the sales up to ₹ 10,000

$$= 4\% \text{ of } ₹ 10,000 = ₹ \boxed{\phantom{0000}}$$

Also, he receives 5% commission on the sales over ₹ 10,000.

Now, sales over ₹ 10,000

$$= \text{Total sales} - ₹ \boxed{\phantom{0000}}$$

$$= ₹ \boxed{\phantom{0000}}$$

$\therefore$  Salesman's commission on the sales upto ₹ 25,000

$$= 5\% \text{ of } ₹ \boxed{\phantom{0000}} = ₹ \boxed{\phantom{0000}}$$

$$\therefore \left( \begin{array}{l} \text{salesman's} \\ \text{total income} \end{array} \right) = \left( \begin{array}{l} \text{commission} \\ \text{on the sales} \\ \text{upto } ₹ 10,000 \end{array} \right) + \left( \begin{array}{l} \text{commission} \\ \text{on the sales} \\ \text{upto } ₹ 25,000 \end{array} \right)$$

$$= ₹ \boxed{\phantom{0000}}$$



### Multiple Choice Questions

- Which of the following is true?
  - Invoice Price = Catalogue price – Trade discount
  - Trade discount = List price + Invoice price
  - Profit = Cost price – Net price
  - Invoice price = Net Price – Cash discount
- Trade discount is allowed on the \_\_\_\_\_.
  - cost price
  - catalogue price
  - invoice price
  - net price
- A person who draws the bill is called the \_\_\_\_\_.
  - drawee
  - drawer
  - agent
  - broker



4. \_\_\_\_\_ is the sum due on the present worth.  
 (A) Principal (B) True discount  
 (C) Face value (D) Cash value
5. True discount is the interest on the \_\_\_\_\_.  
 (A) sum due  
 (B) present worth  
 (C) banker's gain  
 (D) banker's discount
6. Banker's discount is called as \_\_\_\_\_.  
 (A) cash discount  
 (B) true discount  
 (C) commercial discount  
 (D) trade discount
7. Banker's discount is always higher than \_\_\_\_\_.  
 (A) true discount (B) cash discount  
 (C) trade discount (D) sum due
8. An agent charges commission at 9% on the sale value. For the sale value of ₹ 20,000, the agent will get a commission of ₹ \_\_\_\_\_.  
 (A) 2,000 (B) 1,800  
 (C) 1,700 (D) 1,850
9. A home was sold through an agent for ₹ 12 lakh. He charged 5% commission to both buyer and seller. What is the total amount paid by the buyer?  
 (A) ₹ 13 lakh (B) ₹ 13.2 lakh  
 (C) ₹ 12.6 lakh (D) ₹ 11.4 lakh
10. A salesman get fixed monthly salary of ₹ 5,000 and 4% commission on sale over ₹ 15,000. If his total sale for the particular month is ₹30,000, then what is his total earning?  
 (A) ₹ 5,600 (B) ₹ 4,400  
 (C) ₹ 6,000 (D) ₹ 6,200
11. If an agent receive ₹ 2,000 as commission on a sale of ₹ 25,000, then what is his rate of commission?  
 (A)  $8\frac{1}{2}\%$  (B) 9%  
 (C) 8% (D)  $9\frac{1}{2}\%$
12. A person gets 5% trade discount and 8% cash discount on a purchase of heater worth ₹ 6,000, what is the net payable amount of the heater for the person?  
 (A) ₹ 5,245 (B) ₹ 5,244  
 (C) ₹ 5,000 (D) ₹ 5,400
13. A book seller is given 10% trade discount on a list price of ₹ 5,000. What is the Invoice price?  
 (A) ₹ 4,500 (B) ₹ 5,500  
 (C) ₹ 4,540 (D) ₹ 5,540
14. A trader allows a 2% discount on a article marked at ₹ 2,500. If cost price of the article is ₹ 2150, then profit gained by the trader is  
 (A) ₹ 300 (B) ₹ 310  
 (C) ₹ 350 (D) ₹ 340
15. For the cash sale of ₹ 9,000 commission of 5% is allowed and for the credit sale of ₹ 15,700 commission of 7% is allowed. What is ratio of total commission to the credit commission?  
 (A)  $\frac{1549}{1099}$  (B)  $\frac{1549}{450}$   
 (C)  $\frac{1099}{1549}$  (D)  $\frac{1099}{450}$
16. If the sum due of a bill 9 months hence is ₹ 5,600 at 8% p.a., what is the present worth?  
 (A) ₹ 5,381.02 (B) ₹ 5,283.02  
 (C) ₹ 5,274.02 (D) ₹ 5,293.20
17. What is the true discount on a present worth of ₹ 7,700 due 9 months at 12% p.a.?  
 (A) ₹ 694 (B) ₹ 695  
 (C) ₹ 693 (D) ₹ 696
18. A bill drawn on 2<sup>nd</sup> February 2006 for 4 months was discounted on 3<sup>rd</sup> March 2006. What is the legal due date?  
 (A) 2<sup>nd</sup> June 2006 (B) 5<sup>th</sup> June 2006  
 (C) 2<sup>nd</sup> May 2006 (D) 5<sup>th</sup> May 2006
19. A bill of 5,000 drawn on 1<sup>st</sup> January 2009 for 9 months was discounted on 10<sup>th</sup> April 2009. The number of days from the date of discounting to the legal due date are?  
 (A) 183 days (B) 174 days  
 (C) 147 days (D) 177 days
20. What is the banker's discount on a bill of ₹ 6,230 due 5 months at  $5\frac{1}{2}\%$  p.a. ?  
 (A) ₹ 142.77 (B) ₹ 141.77  
 (C) ₹ 144.06 (D) ₹ 144.07
21. A banker's discount calculated for 2 years is 21 times his gain. Then the rate of interest is  
 (A) 4% (B) 3%  
 (C)  $2\frac{1}{2}\%$  (D) 2%.
22. If the banker's discount for the bill is ₹ 540 for 5 months at 5% p.a., then what is the amount of the bill?  
 (A) ₹ 25,920 (B) ₹ 25,940  
 (C) ₹ 25,900 (D) ₹ 1,29,600
23. The difference between true discount and banker's discount on a bill is ₹ 210 for 7 months at 6% p.a. what is the true discount?  
 (A) ₹ 6,000 (B) ₹ 5,600  
 (C) ₹ 5,000 (D) ₹ 5,600



24. If the banker's discount for the bill drawn on 12<sup>th</sup> November 2009 for 5 months at 3% p.a. was ₹ 150, then on which day the bill was discounted?  
Face value of the bill is ₹ 25,000  
(A) 1<sup>st</sup> February 2010  
(B) 27<sup>th</sup> February 2010  
(C) 1<sup>st</sup> February 2009  
(D) 27<sup>th</sup> February 2009
25. An agent charges 5% commission and earns ₹ 26,250 on the sale of L.C.D.'s. If price of a one L.C.D. is ₹ 15,000, then number of L.C.D.'s sold by him?  
(A) 40 (B) 35  
(C) 45 (D) 30



Additional Problems for Practice

Based on Exercise 1.1

- +1. A merchant gives his agent 5% ordinary commission plus 2% del credere commission on sale of goods, worth ₹ 55,000/-. How much does the agent receive? How much does the merchant receive?
- +2. The price of refrigerator is ₹ 47,000. An agent charges commission at 6% and earns ₹ 42,300. Find the number of refrigerators.
- +3. A house was sold through an agent for ₹ 60 lakh. He charged 1% Commission from both buyer and seller. Calculate agent's commission. Calculate the net amount received by the seller and amount paid by the buyer.
- +4. A sales representative gets fixed monthly salary plus commission based on the sales. In two successive months he received ₹ 23,500 and ₹ 24,250 on the sale of ₹ 70,000 and ₹ 85,000 respectively. Find his monthly salary and the rate of commission on sales.
- +5. The income of an agent remains unchanged through the rate of commission in increased from 5% to 6.25%. Find the percentage reduction in the value of business.
- +6. A salesman receives 8% commission on the total sales. If his sales exceed ₹ 20,000 he receives an additional commission at 2% on the sales over ₹ 20,000/-. If he receives ₹ 7,600 as commission, find his total sales.
- +7. M/s. Saket Electronics is given 15% trade discount and 5% cash discount on purchase of television sets by the distributor. Find the total discount availed if M/s. Saket Electronics purchases TV sets worth ₹ 12,00,000 from the distributor.
- +8. Vaishnavi wants to buy an i-phone worth ₹ 55,000. A shopkeeper gives 8% trade discount and 8% cash discount. Another shopkeeper gives 10% trade discount and 5% cash discount. Which shopkeeper should be preferable?
- +9. A motor bike is marked at ₹ 50,000. A retailer allows a discount at 16% and still gains 20% on the cost. Find purchase price of the retailer.
- +10. Prakash gets a commission at 10% on cash sales and 8% on credit sales. If he receives ₹ 4,400 as commission on the total sales of ₹ 50,000. Find the sales made by him in cash and on credit.
- +11. Mr. Anand charges 10% commission on cash sales and 8% commission on credit sales. If his overall commission is 8.8%, Find the ratio of cash sales to the credit sales.
12. An agent charges 12% commission on the sales. What does he earn if the total sales amount to ₹ 36,000? What does the seller get?  
[Mar 15; July 17]
13. Three cars were sold through an agent for ₹ 1,60,000, ₹ 1,48,000 and ₹ 1,50,000 respectively. The rates of commission were 17.5 % on the first, 12.5% on the second. If on the whole the agent received 14% commission on the total sales, find the rate of commission paid on the third car.  
[July 17]
14. A wholesaler allows 25% trade discount and 5% cash discount. Find the list price of an article, if it was sold for the net amount of ₹ 1,140.  
[July 18]
15. The price of a T.V. set is ₹ 17,000. An agent charges at 3% and earns ₹ 25,500. Find the number of T.V. sets sold by him.  
[July 18]
16. An article is marked at ₹ 1,500. A trader allows a discount at 3% and still gains 20% on the cost. Find the cost price of the article.  
[Mar 19]
17. An agent was paid ₹ 58,500 as commission on the sale of computers at the rate of 12.5%. If the price of each computer was ₹ 18,000, how many computers did he sell?  
[Mar 20]

Based on Exercise 1.2

- +1. If the present worth of a bill due six months hence is ₹ 23,000 at 8% p.a., What is sum due?
- +2. What is the true discount on a sum of ₹ 12,720 due 9 months hence at 8% p.a. simple interest?
- +3. The present worth of sum of ₹ 8,268 due 8 months hence is ₹ 7,800. Find the rate of interest.



- +4. A bill of ₹ 15,000 drawn on 15<sup>th</sup> February 2015 for 10 months was discounted on 13<sup>th</sup> May 2015 at  $3\frac{3}{4}$  % p.a. Calculate banker's discount.
- +5. A bill of ₹ 10,100 drawn on 14<sup>th</sup> January for 5 months was discounted on 26<sup>th</sup> March. The customer was paid ₹ 9,939.25. Calculate the rate of interest.
- +6. A bill of ₹ 18,000 was discounted for ₹ 17,568 at a bank on 25<sup>th</sup> October 2017. If the rate of interest was 12% p.a., what is the legal date?
- +7. A bill of ₹ 29,200 drawn on 15<sup>th</sup> June for 6 months, was discounted for ₹ 28,960 at 5% p.a. On which day was the bill discounted?
- +8. Find the true discount, banker's discount and banker's gain on a bill of ₹ 64,800 due 3 months hence discounted at 5% p.a.
- +9. The difference between true discount and banker's discount on a bill due 6 months hence at 4% is ₹ 160. Calculate true discount, banker's discount and amount of bill.
- +10. A banker's discount calculated for 1 year is 13.5 times its banker's gain. Find the rate of interest.
11. The present worth of the sum of ₹ 5,830, due 9 months hence, is ₹ 5,500. Find the rate of interest. **[Mar 15]**
12. A bill of ₹ 2,000 drawn on 15<sup>th</sup> February 2003 for 10 months was discounted on 13<sup>th</sup> May 2003 at  $3\frac{3}{4}$  % p.a. Calculate the banker's discount. **[Oct 15]**
13. Find the true discount, banker's discount and banker's gain on a bill of ₹ 36,600 due 4 months hence at 5% p.a. **[Mar 16]**
14. What is sum due of ₹ 5,000 due 4 months hence at 12.5% p.a. simple interest? **[Mar 17]**
15. A bill was drawn on 12<sup>th</sup> April for ₹ 3,500 and was discounted on 4<sup>th</sup> July at 5% p.a. The Banker paid ₹ 3,465 for the bill. Find period of the bill. **[Mar 18]**
16. If the present worth of a bill due 6 months hence is ₹ 2,500 at 10% per annum, what is the true discount? **[Mar 19]**
17. A bill of ₹ 7,500 was discounted for ₹ 7,290 at a bank on 28<sup>th</sup> October 2006. If the rate of interest was 14% p.a., what is the legal due date? **[Mar 19]**
18. True discount on the sum due 9 months hence at 16% p.a. is ₹ 600. Find the sum due and present worth of the bill. **[July 19]**
19. True discount on a bill is ₹ 1800 and banker's discount is ₹ 1,887. If the bill is due 10 months hence, find the rate of interest. **[July 19]**
20. A bill of ₹ 4,000 drawn on 5<sup>th</sup> January 1998 for 8 months was discounted for ₹ 3,840 on a certain date. Find the date on which it was discounted at 10% p.a. **[Mar 20]**

#### Based on Miscellaneous Exercise – 1

1. A sales executive is paid a fixed weekly salary plus commission based on percentage of sales made by him. If on the sales of ₹ 18,000 and ₹ 16,000 in two successive weeks, he received in all ₹ 2,000 and ₹ 1,800, find his weekly salary and the rate of commission paid to him.
2. A salesman's salary was decreased from ₹ 5,000 to ₹ 4,000. On the same sales due to increase in the rate of commission from 5% to 6% his income remained unchanged. Find his sales.
3. A property dealer is paid a commission of 5% on cash sales and 8% on credit sales made by him. If on the sale of ₹ 45,000 the dealer claims a total commission of ₹ 3000, find the sales made by him for credit.
4. A hardware dealer allows 15% discount on the list price and further discount of 10% for cash payment for a processor. If the list price of the processor is ₹ 7,000, find the invoice price and net price of the processor.
5. A property is sold for ₹ 25 lacs through an estate agent who charges 2% commission from the buyer and 1% commission from the seller. Find the amount paid by the buyer and the amounts received by the seller and the agent.
6. A manufacturer earns a profit of 25% on the cost after allowing a trade discount of 20% and further discount of 5% on cash payment. If he marks the goods for price ₹ 500/- find the net selling price and cost of production.
7. A salesman is allowed  $3\frac{3}{4}$  % commission on the total sales made by him plus a bonus of 2% on the sales over ₹ 15,000. If his total earnings amount to ₹ 2000, find the sales made by him.
8. A banker's discount calculated for 2 years is 11 times his gain. Find the rate of interest.
9. A bill of ₹ 7,500 drawn on 8<sup>th</sup> August 2004 for 5 months was discounted for ₹ 7,350 on a certain date. Find the date on which it was discounted at 10% p.a.
10. A bill of ₹ 7,500 was discounted for ₹ 7,290 at a bank on 28<sup>th</sup> October 2006. If the rate of interest was 14% p.a., what is the legal due date of the bill? **[July 16]**



## Topic Test

Time: 1 hour

Marks: 20

**Q.1. (A) Choose the correct alternative.** [2]

- i. The date on which the period of the bill expires is called  
 (A) Legal Due Date (B) Grace Date  
 (C) Nominal Due Date (D) Date of Drawing
- ii. The sum due is also called as  
 (A) Face value (B) Present value (C) Cash value (D) True discount

**(B) State whether the following statements are True or False.** [2]

- i. The buyer is legally allowed 6 days grace period.  
 ii. The bankers discount is also called as commercial discount.

**(C) Fill in the blanks.** [2]

- i. An \_\_\_\_\_ is an agent who sells the goods by auction.  
 ii. The banker's discount is always \_\_\_\_\_ than the true discount.

**Q.2. Attempt any two of the following.** [4]

- i. An agent charges 12% commission on the sales. What does he earn if the total sale amounts to ₹ 48,000? What does the seller get?
- ii. True discount on a bill is ₹ 2,200 and bankers discount is ₹ 2,310. If the bill is due 10 months, hence, find the rate of interest.
- iii. True discount on the sum due 8 months hence at 12% p.a. is ₹ 560. Find the sum due and present worth of the bill.

**Q.3. Attempt any two of the following.** [6]

- i. Anita is allowed 6.5% commission on the total sales made by her, plus a bonus of  $\frac{1}{2}\%$  on the sale over ₹ 20,000. If her total commission amounts to ₹ 3,400, find the sales made by her.
- ii. The true discount on a sum is  $\frac{3}{8}$  of the sum due at 12% p.a. Find the period of the bill.
- iii. Mr. Anand charges 10% commission on cash sales and 8% commission on credit sales. If his overall commission is 8.8%, find the ratio of cash sales to the credit sales.

**Q.4. Attempt any one of the following.** [4]

- i. The difference between true discount and banker's discount on 6 months hence at 4% p.a. is ₹ 80. Find the true discount, banker's discount and amount of the bill.
- ii. A bill of ₹ 8,000 drawn on 5<sup>th</sup> January 1998 for 8 months was discounted for ₹ 7,680 on a certain date. Find the date on which it was discounted at 10% p.a.

**Answers****Activity for practice**

1. i. 750 ii.  $(x - 10,000)$   
 iii.  $\frac{5x}{100} - 500$  iv.  $\left(\frac{5x}{100} - 500\right)$   
 v. 750 vi. 250

- vii. 20 viii. 36,000  
 2. i. 15 ii. 600  
 iii. 750 iv. 10  
 v. 525 vi. 150  
 vii. 90  
 3. i. Cost price ii. 100  
 iii. List price iv. List price  
 v. 65 vi. 20







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