Commission, Brokerage and Discount

EXERCISE 1.1 [PAGES 5 - 6]

Exercise 1.1 | Q 1 | Page 5

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.

: Commission to agent = Sales × Rate of commission

=48000 × 12/100

=₹5760

Net amount received by seller = Sales – Commission = 48,000 – 5,760 = ₹ 42,240

∴ Salesman earns ₹ 5,760 as commission and amount received by seller is ₹ 42240.

Exercise 1.1 | Q 2 | Page 5

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 up to ₹ 50,000 and 4% commission on the sales over ₹ 50000.

His total sales is ₹ 2,00,000.

∴ Commission on sales upto ₹ 50,000

$$= 50000 imes rac{3}{100}$$
 = ₹ 1500

Commission on sales over ₹ 50,000

$$= (200000 - 50000) \times \frac{4}{100}$$
$$= 150000 \times \frac{4}{100}$$

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Total commission = 1,500 + 6,000 = ₹ 7,500

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

Exercise 1.1 | Q 3 | Page 5

Ms. Saraswati was paid ₹ 88,000 as a 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 × 12.5%

= ₹ 4,000

Total commission earned is ₹ 88,000.

Number of total computers sold

 $= \frac{\text{Total commission}}{\text{Commission per Computers}}$ $= \frac{88000}{4000} = 22$

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

Exercise 1.1 | Q 4 | Page 5

Anita is allowed 6.5% commission on the total sales made by her, plus a bonus of 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 × Rate of commission

$$= \mathrm{x} imes rac{6.5}{100} = rac{6.5\mathrm{x}}{100}$$

Sales above ₹ 20,000 = (x - 20,000)





On sales above ₹ 20,000, she gets $\frac{1}{2}$ % bonus. ∴ Commission earned = $(x - 20000) \times \frac{0.5}{100}$ = $\frac{0.5x - 10000}{100}$

Total commission earned is ₹ 3,400.

Total commission = Commission on total sales + Bonus on sales

 $\therefore 3400 = \frac{6.5x}{100} + \frac{0.5x - 10000}{100}$ $\therefore 3400 = \frac{6.5x + 0.5x - 10000}{100}$

- ∴ 340000 = 7x 10000
- ∴ 340000 + 10000 = 7x
- ∴ 350000 = 7x
- ∴ x = 50000
- ∴ Total sales made by Anita is ₹ 50,000.

Exercise 1.1 | Q 5 | Page 5

Priya gets a 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.

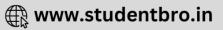
Solution: Priya gets a salary of ₹ 15,000 per month and 8% on the sales over ₹ 50,000. Let the total sales be ₹ 'x'.

$$\therefore$$
 Commission earned = (x - 50000) $\times \frac{8}{100}$

She has earned ₹ 17,400 in a certain month.

... Total income = Salary per month + Commission on sale





$$17,400 = 15,000 + (x - 50,000) \times \frac{8}{100}$$
$$17400 = 15000 + \frac{8x - 400000}{100}$$
$$17400 = \frac{1500000 + 8x - 400000}{100}$$

17400 x 100 = 1500000 + 8x - 400000 1740000 = 1100000 + 8x 8x = 1740000 - 1100000 8x = 640000 $\therefore x = 80000$ \therefore Priya made sales of ₹ 80000 in that month.

Exercise 1.1 | Q 6 | Page 5

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%.

∴ The 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 New income of the agent = $x imes rac{5}{100}=rac{5x}{100}$

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





$$\therefore 4 = \frac{5x}{100}$$
$$\therefore 5x = 400$$
$$\therefore x = 80$$

 \therefore New value of business is ₹ 80.

Reduction in business

$$= \frac{\text{Old value} - \text{New value}}{\text{Old value}} \times 100$$
$$= \frac{100 - 80}{100} \times 100$$

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

Exercise 1.1 | Q 7 | Page 5

Mr. Pavan is paid a fixed weekly salary plus commission based on a 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

 \div For first week, his income is,

9880 = Salary + Commission on 68000 ...(i)

 \div For second week his income is,

10180 = Salary + commision on 73000(ii)

Subtracting (i) from (ii) we get,

Salary + Commission on 73,000 = 10,180

(-) Salary + Commission on 68,000 = 9,880



<u>(-)</u> (-)

Commission on 5,000 = 300

∴ On sales of ₹ 5,000, commission is ₹ 300

Commission = Sales × Rate of commission

 \therefore 300 = 5,000 × Rate of commission

 \therefore Rate of commission = $\frac{300}{5000} \times 100$ = 6%

∴ Commission on sales of ₹ 68,000 at the rate of 6%

$$= 68,000 \times \frac{6}{100} = 74080$$

- ∴ Substituting ₹ 4,080 in equation (i),
- Salary + Commission on 68,000 = 9,880

Salary + 4,080 = 9,880

∴ Salary = 9,880 – 4,080 = ₹ 5,800

... Weekly salary of Pavan is ₹ 5,800 and rate of commission is 6%.

Exercise 1.1 | Q 8 | Page 5

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%

- : Initial income of Deepak
- = Salary + Commission on sales

$$=4000+3\%$$
 on x

$$=4000+rac{3x}{100}$$
 ...(i)

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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

= 5000 + 2% on x

= 5000 + (2x)100 ...(ii)

It is given that the income of Deepak remained unchanged.

$$\therefore 4000 + \frac{3x}{100} = 5000 + \frac{2x}{100} \qquad \text{.....[From (i) and (ii)]}$$
$$\therefore \frac{400000 + 3x}{100} = \frac{500000 + 2x}{100}$$

- $\therefore 400000 + 3x = 500000 + 2x$
- $\therefore 3x 2x = 500000 400000$
- ∴ x = 100000
- ∴ Sales made by Deepak is ₹ 1,00,000.

Exercise 1.1 | Q 9 | Page 5

An agent is paid a commission of 7% on cash sales and 5% on credit sales made by him. If on the sale ₹ 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

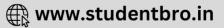
 \therefore Credit sales = 1,02,000 - x

Rate of commission on cash sales = 7%

Rate of commission on credit sales = 5%

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





$$\therefore 6420 = x \times \frac{7}{100} + (102000 - x) \times \frac{5}{100}$$
$$\therefore 6420 = \frac{7x}{100} + \frac{510000 - 5x}{100}$$
$$\therefore 6420 = \frac{7x + 510000 - 5x}{100}$$

$$\therefore 6420 \times 100 = 2x + 510000$$

- $\therefore 642000 = 2x + 510000$
- ∴ 2x = 642000 510000
- ∴ 2x = 132000
- ∴ x = 66000
- ∴ Cash sales = ₹ 66000

Credit sales = 102000 - x

= 102000 - 66000

= ₹ 36000

∴ Cash sales made by agent is ₹ 66,000 and credit sales is ₹ 36,000.

Exercise 1.1 | Q 10 | Page 5

Three cars were sold through an agent for \gtrless 2,40,000, \gtrless 2,22,000 and \gtrless 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.

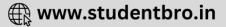
Solution: Three cars were sold by agent for ₹ 2,40,000, ₹ 2,22,000 and ₹ 2,25,000 respectively.

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





$$= \frac{14}{100} \times (2, 40, 000 + 2, 22, 000 + 2, 25, 000)$$

$$= \frac{14}{100} \times 6, 87, 000$$

$$= ₹ 96180 \qquad \dots (i)$$
Commission on first car = 2, 40, 000 × $\frac{17.5}{100} = ₹ 42000 \qquad \dots (ii)$
Commission on second car = 2, 22, 000 × $\frac{12.5}{100} = ₹ 27750 \qquad \dots$
(iii)
Let rate of commission on third car be x%.
Commission on third car = 2, 25, 000 × $\frac{x}{100} \qquad \dots (iv)$
Total commission = Commission on first car + Commission on second car = 2, 25, 000 × 100 \qquad \dots (iv)

∴ From (i), (ii), (iii) and (iv),
96, 180 = 42,000 + 27,750 + 2,25,000 ×
$$\frac{x}{100}$$

∴ 96, 180 = 69,750 + 2,25,000 × $\frac{x}{100}$
∴ 2,25,000 × $\frac{x}{100}$ = 96,180 - 69,750
∴ 2,25,000 × $\frac{x}{100}$ = 26,430
∴ x = $\frac{26,430 \times 100}{225000}$
∴ x = 11.75%

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

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Exercise 1.1 | Q 11 | Page 5

Swatantra Distributors 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 Distributors gives 15% discount on list price.

$$\therefore$$
 Discount = $x imes rac{15}{100} = 0.15 imes$

:. Net price = x - 0.15x = 0.85x

Further cash discount is given at 5%.

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

: Net selling price = 0.85x - 0.0425x = 0.8075x

However, net selling price is ₹ 38,356.25.

$$\therefore x = \frac{38356.25}{0.8075}$$

- ∴ x = ₹ 47,500
- ∴ List price of washing machine is ₹ 47,500.

Exercise 1.1 | Q 12 | Page 6

A book seller ₹ 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.

Commission earned = List price × Rate of commission





$$\therefore 1,530 = x \times \frac{15}{100}$$
$$\therefore x = \frac{1,530 \times 100}{15}$$
$$\therefore x = 10,200$$

∴ List price of the books is ₹ 10,200.

Exercise 1.1 | Q 13 | Page 6

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.

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Solution: Let the marked price of the suit be 'x'.

Seller allows discount of 8% on marked price.

$$\therefore$$
 Discount = $x imes rac{8}{100} = 0.08 ext{x}$

 \therefore Net price = x - 0.08x = 0.92x

Further cash discount of 4% is given.

- \therefore Cash discount = $0.92x imes rac{4}{100} = 0.0368x$
- ∴ Net selling price = 0.92x 0.0368x = 0.8832x

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

 $\therefore x = \frac{8832}{0.8832}$

∴ x = ₹ 10000

∴ Marked price (list price) ₹ 10,000.

Retailer has made 38% profit on cost price.

Let the cost price be y.

Profit = $y \times \frac{38}{100} = \frac{38y}{100}$ Cost price + Profit = Selling price $\therefore y + \frac{38y}{100} = 8,832$ $\therefore \frac{100y + 38y}{100} = 8,832$ $\therefore \frac{138y}{100} = 8,832$ $\therefore y = \frac{8,832 \times 100}{138} = ₹ 6400$

∴ The cost price of the suit is ₹ 6,400 and list price (marked price) is ₹ 10000.

Exercise 1.1 | Q 14 | Page 6

An agent charges 10% commission plus 2% delcreder. 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% declreder commission.

Commission earned = Sale value × Rate of commission

$$= 37,200 \times \frac{10}{100}$$

= ₹ 3720(i)

Delcreder commission earned = Sale value Rate of commission

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$$= 37,200 \times \frac{2}{100}$$

= ₹ 744(ii)
∴ Total commission earned = 3,720 + 744[from (i) and (ii)]
= ₹ 4,464
∴ Agent's total earnings is ₹ 4,464.

Exercise 1.1 | Q 15 | Page 6

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.

 \therefore Trade discount = 25% of List price

$$=rac{25}{100} imes 1600$$
 = ₹ 400

Invoice Price = List price - Trade discount

= 1,600 - 400 = ₹ 1,200

Also, the wholesaler allows 5% cash discount

.: Cash discount = 5% of invoice price

$$=\frac{5}{100}$$
 × 1200 = ₹ 60

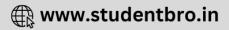
- : Net price = Invoice price Cash discount
- = 1,200 60
- .: Net price = ₹ 1,140
- ∴ Net price of the article is ₹ 1,140.

EXERCISE 1.2 [PAGE 11]

Exercise 1.2 | Q 1 | Page 11

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





Solution:

Sum ₹ 10,920, Period(n) = $\frac{6}{12}$ years, r = 8% p.a.

To find P.W.

S.D. = P.W. + T.D. ...(i)

$$\therefore$$
 S.D. = P.W. + $\left(\frac{P.W. \times n \times r}{100}\right)$
 \therefore S.D. = P.W. $\left(1 + \frac{n \times r}{100}\right)$
 \therefore 10,920 = P.W. $\left(1 + \frac{\frac{6}{12}}{100} \times 8\right)$
 \therefore 10,920 = P.W. $\left(1 + \frac{4}{100}\right)$
 \therefore 10,920 = P.W. $\left(\frac{100 + 4}{100}\right)$
 \therefore 10,920 = P.W. $\left(\frac{104}{100}\right)$
 \therefore 10,920 = P.W. $\left(\frac{104}{100}\right)$
 \therefore P.W. = $\frac{10,920 \times 100}{104}$

∴ P.W. = 10,500

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

Exercise 1.2 | Q 2 | Page 11

What is sum due of ₹ 8,000 due 4 months hence at 12.5% simple interest? **Solution:** Present worth (P.W.) = ` 8,000





Period (n) =
$$\frac{4}{12}$$
 years
r = 12.5%
T.D. = $\frac{P.W. \times n \times r}{100}$
= $\frac{8000 \times \frac{4}{12} \times 12.5}{100}$
= $\frac{8000 \times 4.17}{100}$
= ₹ 333
Sum due (S.D.) = P.W. + T.D

- = 8000 + 333 = 8333
- ∴ Sum due is ₹ 8,333.

Exercise 1.2 | Q 3 | Page 11

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: True discount (T.D.) = ₹ 560

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

r = 12%

To find Present Worth (P.W.)

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

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

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

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

$$P.W. = 7000$$

$$To find sum due$$

$$S.D. = P.W. + T.D.$$

$$= 7,000 + 560$$

$$= 7.560$$

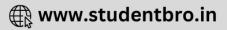
∴ Present worth ₹ 7,000 and sum due is ₹ 7,560.

Exercise 1.2 | Q 4 | Page 11

The true discount on a sum is 3/8 of the sum due at 12% p.a. Find the period of the bill. **Solution:**

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

 \therefore T.D. = $\frac{3}{8} \times (P.W. + T.D.)$
 $\therefore \frac{8}{3}$ T.D. = P.W. + T.D.
 \therefore P.W. = $\frac{8}{3}$ T.D. - T.D.
 \therefore P.W. = $\frac{5}{3}$ T.D.



Also, T.D. =
$$\frac{P.W. \times n \times r}{100}$$
$$\therefore T.D. = \frac{\frac{5}{3}T.D. \times n \times 12}{100}$$
$$\therefore T.D. = \frac{5T.D. \times n \times 12}{3 \times 100}$$
$$\therefore n = \frac{T.D. \times 3 \times 100}{5T.D. \times 12}$$

$$\therefore$$
 n = 5 years

... Period of the bill is 5 years.

Exercise 1.2 | Q 5 | Page 11

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 $\mathfrak{T} \mathfrak{x}$.

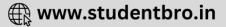
Now, 20 copies of the book are purchased for a certain sum due at the end of 6 months. \therefore P.W. of 20 books = 20x,

n =
$$\frac{6}{12} = \frac{1}{2}$$
 years

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

$$\therefore \text{ S.D.} = \text{P.W.} + \left(\frac{\text{P.W.} \times \text{n} \times \text{r}}{100}\right)$$
$$\therefore \text{ S.D.} = 20\text{x} + \frac{20\text{x} \times \frac{1}{2} \times \text{r}}{100}$$





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

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

 \therefore S.D. of 20 books = cost of 21 copies in ready cash

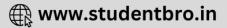
$$\therefore \frac{2,000x + 10xr}{100} = 21x$$
$$\therefore \frac{(2000 + 10r)x}{100} = 21x$$
$$\therefore \frac{2,000 + 10r}{100} = 21$$

- ∴ 2,000 + 10r = 21 × 100
- : 10r = 2,100 2,000
- ∴ 10r = 100
- ∴ r = 100/10
- ∴ r = 10%
- ∴ Rate of interest is 10% p.a.

Exercise 1.2 | Q 6 | Page 11

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 =
$$\frac{6}{12} = \frac{1}{2}$$
 years, r = 9% p.a.
Since, B.D. = $\frac{\text{S.D.} \times \text{n} \times \text{r}}{100}$
 \therefore B.D. = $\frac{4,240 \times \frac{1}{2} \times 9}{100}$



$$=\frac{4,240\times9}{100\times2}$$

∴ 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.

$$\therefore 190.80 = x + \left(x \times \frac{1}{2} \times \frac{9}{100}\right)$$

$$\therefore 190.80 = x + \frac{9x}{200}$$

$$\therefore 190.80 = \frac{209x}{200}$$

$$\therefore x = \frac{190.80 \times 200}{209}$$

$$\therefore x = \text{ $$182.58$}$$

Also, B.G. = B.D. - T.D. = 190.8 - 182.58

∴ B.G. = ₹ 8.22 ≈ ₹ 8.20

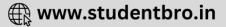
∴ True discount, banker's discount and banker's gain are ₹ 182.60, ₹ 190.80 and ₹ 8.20 respectively.

Exercise 1.2 | Q 7 | Page 11

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 = $\frac{10}{12} = \frac{5}{6}$ years





B.D. = T.D. + Interest on T.D. $\therefore 2,310 = 2,200 + \frac{2,200 \times 5 \times r}{6}$ $\therefore 2,310 - 2,200 = \frac{2,200 \times 5 \times r}{6}$ $\therefore r = \frac{110 \times 6}{2,200 \times 6}$ $\therefore r = 6\%$

.: The rate of interest is 6% p.a.

Exercise 1.2 | Q 8 | Page 11

A bill of ₹ 6,395 drawn on 19th January 2015 for 8 months was discounted on 28th 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 = ₹ 6,395

r = 8%

Date of drawing = 19th January, 2015

Period of bill = 8 months

Nominal due date = 19th September, 2015

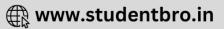
Legal due date = 22nd September, 2015

Date of discounting = 28th February, 2015

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

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





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

B.D. = Interest on F.V. for 206 days at 8% p.a.
∴ B.D. = $\frac{6,395 \times 206 \times 8}{365 \times 100}$
∴ B.D. = = 288.74

Cash value = Face Value – Banker's discount

= 6,395 - 288.74 = 6,106.26

∴ Banker's discount is ₹ 288.74 and Cash value of the bill is ₹ 6,106.26.

Exercise 1.2 | Q 9 | Page 11

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A bill of ₹ 8,000 drawn on 5th 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 Banker discount (B.D.) = F.V. – C.V. = 8,000 – 7,680 = ₹ 320 Date of drawing = 5th January 1998 Period = 8 months

Nominal due date = 5^{th} September 1998

Legal due date = 8th September 1998

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

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

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

∴
$$n = 146 \text{ days}$$

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

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

The date on which bill was discounted is 15th April 1998.

Exercise 1.2 | Q 10 | Page 11

A bill drawn on 5th June for 6 months was discounted at the rate of 5% p.a. on

19th October. If the cash value of the bill is ₹ 43,500, find face value of the bill.

Solution: Given, Date of drawing = 5th June

Period of the bill = 6 months

 \therefore Nominal due date = 5th December

Legal due date = 8^{th} December

Date of discounting = 19th 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:

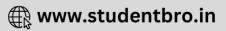
12 30 8 50	Oct	Nov	Dec	Total
			8	50

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

Let F.V. of the bill be x.

C.V. = F.V. - B.D.
43,500 =
$$x - \frac{F.V \times n \times n}{100}$$

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



$$egin{aligned} 43,500 &= x igg(1 - rac{1}{146}igg) \ 43,500 &= x imes rac{145}{146} \ x &= 43,500 imes rac{146}{145} \end{aligned}$$

x = ₹ 43,800

∴ Face value of the bill is ₹ 43,800.

Exercise 1.2 | Q 11 | Page 11

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

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

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

Banker's discount (B.D.) = F.V. - C.V.

= 7,000 - 6,930

= 70

Date of drawing bill = 14th April

Date of discounting bill = 6th July

We know that,

Banker's discount =
$$\frac{\text{F.V.} \times \frac{\text{n}}{365} \times \text{r}}{100}$$
$$\therefore 70 = \frac{7,000 \times \frac{\text{n}}{365} \times 5}{100}$$
$$\therefore \text{n} = \frac{70 \times 100 \times 365}{7000 \times 5}$$

∴ 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 = 17th September

: Nominal due date = $17 - 3 = 14^{\text{th}}$ September

Date of drawing bill = 14th April.

: Period of bill from drawing date is of 5 months.

Exercise 1.2 | Q 12 | Page 11

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

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

Let True discount be ₹ x

Now, B.G. = Interest on T.D. for 4 months $\left(\frac{1}{3}\text{ years}\right)$ at 5% p.a.

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

∴ True discount is ₹ 1,200.

: B.D. = 20 + 1,200

∴ B.D. = ₹ 1,220

∴ Banker's discount is ₹ 1,220.

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

Let the face value ₹ y i.e., B.D. = $\frac{y \times n \times r}{100}$ $\therefore 1,220 = \frac{y \times \frac{1}{3} \times 5}{100}$ $\therefore 1,220 \times 100 = y \times \frac{5}{3}$ $\therefore y = \frac{1,22,000 \times 3}{5}$

∴ y = ₹ 73,200

∴ True discount, Banker's discount and Amount of the bill (face value) is ₹ 1,200, ₹

1,220 and ₹ 73,200 respectively.

Exercise 1.2 | Q 13 | Page 11

A bill of ₹ 51,000 was drawn on 18th February 2010 for 9 months. It was encashed on 28th 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 = 18th February 2010

Date of discounting = 28th June 2010

Period of bill = 9 months

Nominal due date = 18th November 2010

Legal due date = 21st 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. = $\frac{\text{P.W.} \times \text{n} \times \text{r}}{100}$ $=\frac{\text{P.W.}\times\frac{146}{365}\times5}{100}$ ∴ T.D. = 0.02 P.W. ...(i) Since, S.D. = P.W. + T.D.∴ S.D. = P.W. + 0.02 P.W. ...[From (i)] ∴ 51,000 = 1.02 P.W. \therefore P.W. = $\frac{51,000}{1.02}$ ∴ P.W. = 50,000 Since T.D. = $0.02 \times P.W$. $= 0.02 \times 50000$ = ₹ 1000 ∴ True discount is ₹ 1,000 Banker's gain = $\frac{\text{T.D.} \times \text{n} \times \text{r}}{100}$ $= \frac{1000 \times \frac{146}{365} \times 5}{100}$ = ₹ 20

∴ True discount is ₹ 1,000 and Banker's gain is ₹ 20.

[Note: Answer in the textbook is incorrect.]

Exercise 1.2 | Q 14 | Page 11

A certain sum due 3 months hence is 21/20 of the present worth, what is the rate of interest?

Solution:

Given, S.D. = $\frac{21}{20} \times P.W.$, n = $\frac{3}{12} = \frac{1}{4}$ years Since, S.D. = P.W. + T.D. $\therefore \frac{21}{20} P.W. = P.W. + T.D.$ $\therefore \frac{21}{20} P.W. - P.W. = T.D.$ $\therefore T.D. = \frac{1}{20} P.W.$ Also, T.D. = $\frac{P.W. \times n \times r}{100}$ $\therefore \frac{1}{20} P.W. = \frac{P.W. \times \frac{1}{4} \times r}{100}$ $\therefore \frac{1}{20} = \frac{r}{4 \times 100}$ $\therefore r = \frac{400}{20} = 20\%$ p.a.

∴ Rate of interest is 20% p.a.

Exercise 1.2 | Q 15 | Page 11

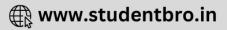
A bill of a certain sum drawn on 28th February 2007 for 8 months was encashed on 26th March 2007 for ₹ 10,992 at 14% p.a. Find the face value of the bill.

Solution: We know that,

Banker's discount (B.D.) = face value – cash value

∴ B.D. = F.V. – 10,992 ...(i)





Date of bill drawn = 28th February 2007

Date of bill discounting = 26th March 2007

Period of bill = 8 months

Nominal due date = 28th October 2007

Legal due date = 31st 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
∴ n = -2	$\frac{219}{219} = \frac{3}{219}$	3						

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≫

$$\frac{1}{365} = \frac{1}{5}$$

Since,

Banker's discount = $rac{ ext{F.V.} imes ext{n} imes ext{r}}{100}$
$\therefore \text{ F.V.} - 10,992 = \frac{\text{F.V.} \times \frac{3}{5} \times 14}{100} \dots \text{ [From (i)]}$
$\therefore \text{ F.V.} - 10,992 = \frac{\text{F.V.} \times 3 \times 14}{100 \times 5}$
$\therefore \text{ F.V.} - \frac{42 \text{ F.V.}}{500} = 10,992$
$\therefore \frac{500 \text{ F.V.} - 42 \text{ F.V.}}{500} = 10,992$
$\therefore \frac{458 \text{ F.V.}}{500} = 10,992$
\therefore F.V. = $10992 imes rac{500}{458}$
∴ F.V. = 12000
∴ Face value of the bill is ₹ 12,000 MISCELLANEOUS EXERCISE 1 [PAGES 11 - 13]

Miscellaneous Exercise 1 | Q 1.01 | Page 11

Choose the correct alternative.

An agent who gives a guarantee to his principal that the party will pay the sale price of goods is called

- 1. Auctioneer
- 2. Del Credere Agent
- 3. Factor
- 4. Broker

Solution: Del Credere Agent

Miscellaneous Exercise 1 | Q 1.02 | Page 11

Choose the correct alternative.

An agent who is given the possession of goods to be sold is known as

- 1. Factor
- 2. Broker
- 3. Auctioneer
- 4. Del Credere Agent

Solution: Factor

Miscellaneous Exercise 1 | Q 1.03 | Page 11

Choose the correct alternative.

The date on which the period of the bill expires is called

- 1. Legal Due Date
- 2. Grace Date
- 3. Nominal Due Date
- 4. Date of Drawing

Solution: The date on which the period of the bill expires is called Nominal Due Date.

Miscellaneous Exercise 1 | Q 1.04 | Page 11

Choose the correct alternative.

The payment date after adding 3 days of grace period is known as

- 1. The legal due date
- 2. The nominal due date





- 3. Days of grace
- 4. Date of drawing

Solution: The payment date after adding 3 days of grace period is known as the legal due date.

Miscellaneous Exercise 1 | Q 1.05 | Page 11

Choose the correct alternative.

The sum due is also called as

- 1. Face value
- 2. Present value
- 3. Cash value
- 4. True discount

Solution: The sum due is also called as Face value.

Miscellaneous Exercise 1 | Q 1.06 | Page 12

Choose the correct alternative.

P is the abbreviation of

- 1. Face value
- 2. Present worth
- 3. Cash value
- 4. True discount

Solution: P is the abbreviation of Present worth.

Miscellaneous Exercise 1 | Q 1.07 | Page 12

Choose the correct alternative.

Banker's gain is simple interest on

- 1. Banker's discount
- 2. Face Value
- 3. Cash value
- 4. True discount

Solution: Banker's gain is simple interest on True discount.

Miscellaneous Exercise 1 | Q 1.08 | Page 12

Choose the correct alternative.





The marked price is also called as

- 1. Cost price
- 2. Selling price
- 3. List price
- 4. Invoice price

Solution: The marked price is also called as Selling price.

Miscellaneous Exercise 1 | Q 1.09 | Page 12

Choose the correct alternative.

When only one discount is given then

- 1. List price = Invoice price
- 2. Invoice price = Net selling price
- 3. Invoice price = Cost price
- 4. Cost price = Net selling price

Solution: When only one discount is given then Invoice price = Net selling price.

Miscellaneous Exercise 1 | Q 1.1 | Page 12

Choose the correct alternative.

The difference between face value and present worth is called

- 1. Banker's discount
- 2. True discount
- 3. Banker's gain
- 4. Cash value

Solution: The difference between face value and present worth is called **True** discount.

Miscellaneous Exercise 1 | Q 2.01 | Page 12

Fill in the Blank.

A person who draws the bill is called _____.

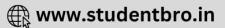
Solution: A person who draws the bill is called Drawee.

Miscellaneous Exercise 1 | Q 2.02 | Page 12

Fill in the Blank.

An _____ is an agent who sells the goods by auction.





Solution: An Auctioneer is an agent who sells the goods by auction.

Miscellaneous Exercise 1 | Q 2.03 | Page 12

Fill in the Blank.

Trade discount is allowed on the _____ price.

Solution: Trade discount is allowed on the <u>Catalogue/list</u> price.

Miscellaneous Exercise 1 | Q 2.04 | Page 12

Fill in the Blank.

The banker's discount is also called _____.

Solution: The banker's discount is also called <u>Commercial Discount</u>.

Miscellaneous Exercise 1 | Q 2.05 | Page 12

Fill in the Blank.

The banker's discount is always _____ than the true discount.

Solution: The banker's discount is always <u>higher</u> than the true discount.

Miscellaneous Exercise 1 | Q 2.06 | Page 12

Fill in the Blank.

The difference between the banker's discount and the true discount is called _____.

Solution: The difference between the banker's discount and the true discount is called **bankers gain**.

Miscellaneous Exercise 1 | Q 2.07 | Page 12

Fill in the Blank.

The date by which the buyer is legally allowed to pay the amount is known as _____.

Solution: The date by which the buyer is legally allowed to pay the amount is known

as legal due date.

Miscellaneous Exercise 1 | Q 2.08 | Page 12

Fill in the Blank.

A _____ is an agent who brings together the buyer and the seller.

Solution: A broker is an agent who brings together the buyer and the seller.

Miscellaneous Exercise 1 | Q 2.09 | Page 12

Fill in the Blanks.





If buyer is allowed both trade and cash discounts, _____ discount is first calculated on _____ price.

Solution: If buyer is allowed both trade and cash discounts, <u>**Trade**</u> discount is first calculated on <u>**Catalogue/list**</u> price.

Miscellaneous Exercise 1 | Q 2.1 | Page 12

Fill in the Blanks.

_____ = List price (catalogue Price) – Trade Discount.

Solution: <u>Invoice Price</u> = List price (catalogue Price) – Trade Discount.

Miscellaneous Exercise 1 | Q 3.01 | Page 12

State whether the following statement is True or False.

Broker is an agent who gives a guarantee to seller that the buyer will pay the sale price of goods.

- 1. True
- 2. False

Solution: False.

Miscellaneous Exercise 1 | Q 3.02 | Page 12

State whether the following statement is True or False.

Cash discount is allowed on list price.

- 1. True
- 2. False

Solution: False.

Miscellaneous Exercise 1 | Q 3.03 | Page 12

State whether the following statement is True or False.

Trade discount is allowed on catalogue price.

- 1. True
- 2. False

Solution: True.

Miscellaneous Exercise 1 | Q 3.04 | Page 12

State whether the following statement is True or False.

The buyer is legally allowed 6 days grace period.



- 1. True
- 2. False

Solution: False.

Miscellaneous Exercise 1 | Q 3.05 | Page 12

State whether the following statement is True or False.

The date on which the period of the bill expires is called the nominal due date.

- 1. True
- 2. False

Solution: True.

Miscellaneous Exercise 1 | Q 3.06 | Page 12

State whether the following statement is True or False.

The difference between the banker's discount and true discount is called sum due.

- 1. True
- 2. False

Solution: False.

Miscellaneous Exercise 1 | Q 3.07 | Page 12

State whether the following statement is True or False.

The banker's discount is always lower than the true discount.

- 1. True
- 2. False

Solution: False.

Miscellaneous Exercise 1 | Q 3.08 | Page 12

State whether the following statement is True or False.

The bankers discount is also called as commercial discount.

- 1. True
- 2. False

Solution: True.

Miscellaneous Exercise 1 | Q 3.09 | Page 12

State whether the following statement is True or False.

In general cash discount is more than trade discount.



- 1. True
- 2. False

Solution: False.

Miscellaneous Exercise 1 | Q 3.1 | Page 12

State whether the following statement is True or False.

A person can get both, trade discount and cash discount.

- 1. True
- 2. False

Solution: True.

Miscellaneous Exercise 1 | Q 4.01 | Page 12

A salesman gets a commission of 6.5% on the total sales made by him and bonus of

1% on sales ₹ 50,000. Find his total income on a turnover of ₹ 75,000.

Solution: Salesman gets commission of 6.5% on total sales and 1% on sales over ₹ 50,000.

Salesman has made sales of ₹ 75,000.

Normal commission earned = 6.5% on total sales

$$=rac{6.5}{100} imes 75,000$$

= 4,875

Bonus = 1% on sales over 50,000

$$=rac{1}{100} imes 25,000$$

= 250

Total income earned = 4,875 + 250 = ₹ 5,125

∴ Total income of the salesman is ₹ 5,125.

Miscellaneous Exercise 1 | Q 4.02 | Page 12

A shop is sold at 30% profit, the amount of brokerage at the rate of 3/4 % amounts to

₹ 73,125. Find cost of the shop





Solution: It is given that,

Brokerage is ₹ 73,125 and brokerage rate is $\frac{3}{4}$ %

Let selling price be x.

Brokerage = Selling price of shop × Brokerage rate

∴ 73, 125 = x ×
$$\frac{3}{4}$$
%
∴ 73, 125 = x × $\frac{0.75}{100}$ %
∴ x = $\frac{73, 125 \times 100}{0.75}$
∴ x = 97,50,000

 \therefore Selling price for the shop is 97,50,000.

It is mentioned that shop is sold at 30% profit.

If purchase price is ₹ 100, then selling price is ₹ 130.

For selling price ₹ 97,50,000, cost price will be $100 \rightarrow 130$

:. Cost price = $\frac{97, 50,000 \times 100}{130}$ = 75,00,000

∴ Cost of the shop is ₹ 75,00,000.

Miscellaneous Exercise 1 | Q 4.03 | Page 13

A merchant gives 5% commission and 1.5% del credere to his agent. If the agent sells goods worth ₹ 30,600 how much does he get? How much does the merchant receive?

Solution: Merchant gives 5% commission and 1.5% del credere commission.

Goods sold by agent = ₹ 30,600





.: Commission earned = Rate of commission × Goods sold

= 5% × 30,600

= ₹ 1,530

Delcredere commission earned = $1.5\% \times 30,600$

= ₹ 459

: Total commission earned by agent

= ₹ 1,530 + 4,59

= ₹ 1,989

: Amount received by Merchant

= Goods sold – Commission given

= 30,600 - 1,989

= ₹ 28,611

∴ Commission given to the agent is ₹ 1,989 and merchant will receive ₹ 28,611 after deducting commission.

Miscellaneous Exercise 1 | Q 4.04 | Page 13

After deducting commission at $7\frac{1}{2}$ % on first

₹ 50,000 and 5% on balance of sales made by him, an agent remits

₹ 93,750 to his principal. Find the value of goods sold by him.

Solution:

Agent earns commission at $7\frac{1}{2}$ % i.e. 7.5% on first ₹ 50,000 sales and on balance, at 5%.

Let total sales be 'x'.

Commission earned on first ₹ 50,000 at 7.5%



$$=\frac{7.5}{100} \times 50,000$$

= ₹ 3,750

Commission earned on balance at 5%

=
$$(x - 50,000) \times \frac{5}{100}$$

Total commission earned
= Total sales – Amount remitted
= $x - 93,750$
 $\therefore (x - 93,750) = 3,750 + \frac{5}{100} \times (x - 50,000)$
 $\therefore (x - 93,750) \times 100 = 3,750 \times 100 + 5(x - 50,000)$
 $\therefore 100x - 93,75,000 = 3,75,000 + 5x - 2,50,000$
 $\therefore 100x - 5x = 1,25,000 + 93,75,000$
 $\therefore 95x = 95,00,000$
 $\therefore x = \frac{95,00,000}{95}$
 $\therefore x = 1,00,000$
 \therefore The value of goods sold by the agent is

₹ 1,00,000.

Miscellaneous Exercise 1 | Q 4.05 | Page 13

The present worth of ₹ 11,660 due 9 months hence is ₹ 11,000. Find the rate of interest. **Solution:**





Sum due = ₹ 11,660, Present worth = ₹ 11,000. n = $\frac{9}{12}$ years True discount = Sum due - Present worth = 11,660 - 11,000 = 660 True discount = $\frac{P.W. \times n \times r}{100}$ $660 = \frac{11,000 \times \frac{9}{12} \times r}{100}$ $660 \times 100 = 11,000 \times \frac{9}{12} \times r$ $\therefore r = \frac{660 \times 100 \times 12}{11,000 \times 9}$

∴ r = 8%

 \therefore The rate of interest is 8% p.a.

Miscellaneous Exercise 1 | Q 4.06 | Page 13

An article is marked at ₹ 800, a trader allows a discount of 2.5% and gains 20% on the cost. Find the cost price of the article.

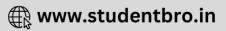
Solution:

Article is marked at ₹ 800.

Discount at 2.5% on ₹ 800 = $800 \times \frac{2.5}{100}$ =

₹ 20

- .: Selling price = Marked price Discount
- = 800 20 = ₹ 780



Trader gains 20% profit on cost.

∴ If the cost price is ₹ 100, then selling price will

₹ 120.

We need to find cost, for selling price = 780

Cost price will be

100 → 120

? → 780

$$\therefore \text{ Cost price} = \frac{780 \times 100}{120} = 650$$

∴ The cost of the article is ₹ 650.

Miscellaneous Exercise 1 | Q 4.07 | Page 13

A salesman is paid fixed monthly salary plus commission on the sales. If on sale of ₹ 96,000 and ₹ 1,08,000 in two successive months he receives in all ₹ 17,600 and ₹ 18,800 respectively, find his monthly salary and rate of commission paid to him.

Solution: Salesman gets salary plus commission.

Income of salesman in the first month

= Salary + Commission on sales

17,600 = Salary + Commission on ₹ 96,000 ...(i)

Income of salesman in the second month

= Salary + commission on ₹ 1,08,000

18,800 = Salary + commission on ₹ 1,08,000 ...(ii)

Now, subtracting (i) from (ii) we get

18,800 = Salary + commission on ₹ 1,08,000 (-) 17,600 = Salary + commission on ₹ 96,000





<u>(-)</u> (-) (-)

1,200 = commission on 12,000

 $\therefore \text{ Rate of commission} = \frac{1,200 \times 100}{12,000}$

= 10 % p.a.

∴ Commission on sales of ₹ 96,000

$$= 96,000 imes rac{10}{100} = ₹ 9,600$$

Substituting commission 9,600 is equation (i), we get

17,600 = Salary + Commission on ₹ 96,000

∴ 17,600 = Salary + 9,600

∴ 17,600 - 9,600 = Salary

∴ Salary = ₹ 8,000

Monthly salary and rate of commission is ₹ 8,000 and 10% respectively.

Miscellaneous Exercise 1 | Q 4.08 | Page 13

A merchant buys some mixers at 15% discount on catalogue price. The catalogue price is ₹ 5,500 per piece of a mixer. The freight charges amount to 2 1/2 % on the catalogue price. The merchant sells each mixer at 5% discount on catalogue price. His net profit is ₹ 41,250. Find a number of mixers.

Solution: Catalogue price (list price) is ₹ 5,500 per price of mixer.

Merchant buys the mixer at a discount of 15%.

 \therefore Purchase price = List price – Discount



 $=5,500-5,500 imesrac{15}{100}$ = 5,500 - 825= ₹ 4,675 Freight charges are at $2\frac{1}{2}$ % which is 2.5% of catalogue price ∴ Freight = 5,500 × $\frac{2.5}{100}$ = ₹ 137.5 Total cost = Purchase price + Freight = 4,675 + 137.5 = ₹ 4,812.5 Merchant sells each mixer at 5% discount on catalogue price. Net selling price = Catalogue price – Discount $= 5,500 - 5,500 \times \frac{5}{100}$ = 5,500 - 275 = ₹ 5,225

Profit per mixer = Net selling price – Cost

= 5,225 - 4,812.5

= 412.50

Total profit earned is ₹ 41,250

Number of mixers sold = $\frac{\text{Total profit}}{\text{Profit per mixer}}$

 $=\frac{41250}{412.5}$

= 100

100 mixers were sold by merchant to earn

₹ 41,250 as net profit.

Miscellaneous Exercise 1 | Q 4.09 | Page 13

A bill is drawn for ₹ 7,000 on 3rd May for 3 months and is discounted on 25th May at 5.5%. Find the present worth.

Solution: Sum due (S.D.) = ₹ 7,000

Period = 3 months

Date of bill drawn = 3rd May

Nominal due date = 3rd August

Legal due date = 6^{th} August

Date of bill discounting = 25th May

Number of days from bill discounting date to legal due date

Мау	June	July	August	Total
6	30	31	6	73 days
. True discou	nt (T.D.) = $\frac{P.W}{}$	$\frac{1}{100}$ \times n \times r		
$=\frac{\mathrm{P.W.}\times\frac{7}{30}}{100}$				
$T.D. = \frac{1.11}{10}$	P.W. 00(i)			
Also, S.D. = P.V	W. + T.D.			
7,000 = P.	$W. + \frac{1.1 \text{ P.V}}{100}$	V[From ((i)]	
$\therefore 7,000 = \frac{10}{2}$	00 P.W + 1.12 100	P.W.		
∴ 7,000 x 100	= 101.1 P.W.			
$\therefore P.W. = \frac{7,00}{10}$	$\frac{0,000}{01.1}$			
∴ P.W. = 6923	.83 ≅ ₹ 6,923			

∴ Present worth of bill drawn for ₹ 7,000 is

₹ 6,923.

Miscellaneous Exercise 1 | Q 4.1 | Page 13

A bill was drawn on 14th April 2005 for ₹ 3,500 and was discounted on 6th July 2005 at 5% per annum. The banker paid ₹ 3,465 for the bill. Find the period of the bill.

Solution: Given, Face value = ₹ 3,500,

Date of drawing = 14^{th} April 2005,

Date of discount = 6^{th} July 2005,

r = 5% p.a.

Cash value = ₹ 3,465

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

∴ B.D. = 3,500 - 3,465

∴ B.D. = ₹ 35

But, B.D. = interest on F.V. for n years at r % p.a.

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

i.e., $35 = \frac{3,500 \times n \times 5}{100}$
i.e., $35 = 35 \times n \times 5$
i.e., $5n = 1$
i.e., $n = \frac{1}{5}$ year = $\frac{1}{5} \times 365 = 73$ days

 \therefore Period for which the discount is deducted is 73 days, which is counted from date of discounting i.e., 6th July 2005

July	Aug.	Sept	Total
25	31	17	73

: Legal due date is 17th September 2005





- : Nominal due date is 14th September 2005
- : Period of the bill is from 14th April 2005 to 14th September 2005 i.e., 5 months
- \therefore Period of the bill is 5 months.

Miscellaneous Exercise 1 | Q 4.11 | Page 13

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.

Solution:

Given, B.D. – T.D. = ₹ 80,

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

$$r = 4\% \text{ p.a.}$$
Since, B.G. = B.D. - T.D.

$$\therefore \text{ B.G.} = \overline{\$} 80$$
But, B.G. = Interest on T.D. for 6 months $\left(\frac{1}{2} \text{ years}\right)$ at 4% p.a.

$$\therefore 80 = \text{T.D.} \times \frac{1}{2} \times \frac{4}{100}$$

$$\therefore \text{ T.D.} = \frac{80 \times 2 \times 100}{4}$$

$$\therefore \text{ T.D.} = \overline{\$} 4000$$

$$\therefore \text{ True discount is } \overline{\$} 4,000$$
Also, B.G. = B.D. - x

$$\therefore 80 = \text{B.D.} - 4,000$$

$$\therefore \text{ B.D.} = 4,000 + 80$$

$$\therefore \text{ B.D.} = \overline{\$} 4,080$$

∴ Banker's discount is ₹ 4,080. Again, B.D. = interest on F.V. for n years at r % p.a

i.e., B.D. =
$$\frac{\text{F.V.} \times \text{n} \times \text{r}}{100}$$
$$\therefore 4080 = \frac{\text{F.V} \times \frac{1}{2} \times 4}{100}$$
$$\therefore 4080 \times 100 = \text{F.V.} \times 2$$
$$\therefore \text{F.V.} = \frac{4080 \times 100}{2}$$
$$\therefore \text{F.V.} = ₹ 204000$$

∴ True discount, Banker's discount and Amount of the bill is ₹ 4,000, ₹ 4,080 and ₹ 2,04,000 respectively.

Miscellaneous Exercise 1 | Q 4.12 | Page 13

A manufacturer makes clear profit of 30% on cost after allowing 35% discount. If the cost of production rises by 20%, by what percentage should he reduce the rate of discount so as to make the same rate of profit keeping his list prices unaltered.

Solution:

Let the list price be ₹ 100.

Since, the manufacturer allows 35% discount on list price.

Discount = 35% of list price

= 35% of ₹ 100
=
$$\frac{35}{100} \times 100 = ₹ 35$$

Now, selling price = List price - Discount

Also, he gets 30% profit on cost price.



Let the cost price be ₹ x

·· Selling price = Cost price + Profit

∴ Cost price is ₹ 50.

Given, the cost of production rises by 20%

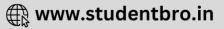
- ... New cost price = Old cost price + Rise in cost price
- = 50 + 20% of old cost price

$$=50+rac{20}{100} imes 50=50+10$$

∴ New cost price = ₹ 60

The rate of profit is to remain same.





New selling price = new cost price + profit

= 60 + 30% of new cost price

$$= 60 + rac{30}{100} imes 60$$

= 60 + 18

∴ New selling price = ₹ 78

But, here the list price remains the same.

... New selling price = List price – New discount

 \therefore 78 = 100 – New discount

 \therefore New discount = 100 – 78

∴ New discount = ₹ 22

 $\therefore \text{ Rate of new discount} = \frac{\text{New Discount}}{100} \times \text{List Price}$

$$=rac{22}{100} imes 100$$
 = 22%

- .:. Reduction in discount (%)
- = Old discount (%) New discount (%)
- = 35% 22%
- = 13%

... Rate of discount should be reduced by 13 % to make the same rate of profit.

Miscellaneous Exercise 1 | Q 4.13 | Page 13

A trader offers 25% discount on the catalogue price of radio and yet makes 20% profit. If he gains ₹ 160 per radio, what must be the catalogue price of the radio? **Solution:** Let the catalogue (list) price of the radio be ₹ 100.





The trader offers 25% discount on the catalogue price.

 \therefore Trade discount = 25% of catalogue price

$$=rac{25}{100} imes 100$$

∴ Trade discount = ₹ 25

Now, Selling price = Catalogue price - Trade discount

= 100 - 25 = ₹ 75

Also, he gets 20% profit.

Let the cost price be ₹ 100,

- ... Selling price = Cost price + Profit
- = 100 + 20% of cost price

$$= 100 + \frac{20}{100} \times 100$$

= 100 + 20
= ₹ 120
∴ For selling price of ` 75,
Cost price = $\frac{100 \times 75}{120}$ = ₹ 62.5
∴ Profit = Selling price - Cost price
= 75 - 62.5





∴ Profit = ₹ 12.5

Now, if the catalogue price is `100, then profit is ₹ 12.5.

∴ For profit of ₹ 160

Catalogue price = $\frac{100 \times 160}{12.5}$ = ₹ 1280

∴ Catalogue price of the radio is ₹ 1,280.

Miscellaneous Exercise 1 | Q 4.14 | Page 13

A bill of ₹ 4,800 was drawn on 9th March 2006 at 6 months and was discounted on 19th April 2006 for 6 1/4 % p.a. How much does the banker charge and how much does the holder receive?

Solution: Given, Face value = ₹ 4,800,

Date of drawing = 9th March 2006,

Period of the bill = 6 months,

 \therefore Nominal due date = 9th September 2006,

Legal due date = 12^{th} September 2006,

Date of discount = 19th April 2006

r =
$$6\frac{1}{4}\% = \frac{25}{4}\%$$
 p.a.

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

April	Мау	June	July	Aug	Sept	Total
11	31	30	31	31	12	146



$$\therefore$$
 n = $rac{146}{365}=rac{2}{5}$ year

Since, B.D. = interest on F.V. for n years at r %

i.e., B.D. = $\frac{F.V, \times n \times r}{100}$ = $\frac{4800 \times \frac{2}{5} \times \frac{25}{4}}{100}$ = $\frac{4800 \times 2 \times 25}{100 \times 5 \times 4}$ ∴ B.D. = ₹ 120 Also, B.D. = F.V. - C.V. ∴ 120 = 4,800 - C.V. ∴ C.V. = 4,800 - 120 ∴ C.V. = ₹ 4,680

∴ Banker charges ₹ 120 and holder receives
 ₹ 4,680.

Miscellaneous Exercise 1 | Q 4.15 | Page 13

A bill of ₹ 65,700 drawn on July 10 for 6 months was discounted for ₹ 65,160 at 5% p.a. On what day was the bill discounted?

Solution: Given, Face value = ₹ 65,700 Date of drawing = 10^{th} July Period of the bill = 6 months \therefore Nominal due date = 10^{th} January Legal due date = 13^{th} January r = 5% p.a. Cash value = ₹ 65,160 Since, B.D. = F.V. - C.V. = 65,700 - 65,160

∴ B.D. = ₹ 540

But, B.D. = interest on F.V. for n years at r %

i.e., B.D. =
$$\frac{\text{F.V.} \times \frac{\text{n}}{365} \times \text{r}}{100}$$
$$\therefore 540 = \frac{65700 \times \text{n} \times 5}{100x365}$$
$$\therefore \text{n} = \frac{540 \times 365 \times 100}{65700 \times 5}$$

 \therefore Discount is deducted for 60 days. Thus, the bill is discounted 60 days before 13th January.

Jan	Dec	Nov	Total
13	31	16	60

: Date of discounting the bill is 14th November.

Miscellaneous Exercise 1 | Q 4.16 | Page 13

An agent sold a car and charged 3% commission on sale value. If the owner of the car received

₹ 48,500, find the sale value of the car. If the agent charged 2% from the buyer, find his total remuneration.

Solution: Let sale value of the car be \mathbb{Z} x.

Since, agent charged 3% commission on the sale value

: Agent's commission from seller = 3% of sale value

$$= 3\% \text{ of } x = \frac{3}{100} \times x$$

$$=\frac{3x}{100}$$

Amount received by the owner = Sale value of the car - Agent's commission





$$\therefore 48500 = x - \frac{3x}{100}$$
$$\therefore 48500 = \frac{97x}{100}$$
$$\therefore x = \frac{48500 \times 100}{97}$$

∴ x = ₹ 50,000

∴ Sale value of the car is ₹ 50,000.

: Agent's commission from seller = 3% of sale value

∴ 3% of ₹ 50,000

$$=\frac{3\times50,000}{100}$$

= ₹ 1,500

Also, he charged 2% commission to the buyer.

... Agent's commission from buyer = 2% of sale value

$$=\frac{2}{100}\times 50,000$$

= ₹ 1000

.: Agent's total remuneration = Commission from seller +

Commission from buyer

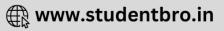
= 1,500 + 1,000 = ₹ 2,500

∴ Sale value of car is ₹ 50,000 and total remuneration of the agent

is ₹ 2,500.

Miscellaneous Exercise 1 | Q 4.17 | Page 13





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.

 \therefore Commission on cash sales = 4% of cash sales

$$=\frac{4}{100}\times x=\frac{4\mathrm{x}}{100}$$

Now, Credit sales = Total sales - Cash sales

 \therefore Credit sales = 51,000 - x

Commission on credit sales

= 6% of credit sales

$$=rac{6}{100} imes (51,000-x)$$

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

$$\therefore 2700 = \frac{4x}{100} + \frac{6}{100}(51000 - x)$$
$$\therefore 2700 = \frac{4x + 306000 - 6x}{100}$$

- $\therefore 270000 = -2x + 306000$
- ∴ 2x = 306000 270000
- ∴ 2x = 36000
- ∴ x = ₹ 18000
- ∴ 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.

