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

$$= 50000 \times \frac{3}{100} = ₹\ 1500$$

Commission on sales over ₹ 50,000

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

$$= 150000 \times \frac{4}{100}$$

= ₹ 6000

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

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

Sales above ₹ 20,000 = (x – 20,000)

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

$\therefore$ 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

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

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

$\therefore$ 340000 = 7x - 10000

$\therefore$ 340000 + 10000 = 7x

$\therefore$ 350000 = 7x

$\therefore$ x = 50000

$\therefore$ 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.

$\therefore$ 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 × 100 = 1500000 + 8x - 400000

1740000 = 1100000 + 8x

8x = 1740000 - 1100000

8x = 640000

∴ x = 80000

∴ 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%.

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

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

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

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

= 20 %

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

$\therefore$ For first week, his income is,

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

$\therefore$ 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

(-) (-) (-)

Commission on 5,000 = 300

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

Commission = Sales × Rate of commission

∴ 300 = 5,000 × Rate of commission

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

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

$$= 68,000 \times \frac{6}{100} = ₹\ 4080$$

∴ 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

$$= 4000 + 3\% \text{ on x}$$

$$= 4000 + \frac{3x}{100} \quad \text{...(i)}$$

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

∴ 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.

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

$\therefore \frac{400000 + 3x}{100} = \frac{500000 + 2x}{100}$

∴ 400000 + 3x = 500000 + 2x

∴ 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

∴ 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

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

$$\therefore 6420 = \frac{7x}{100} + \frac{510000 - 5x}{100}$$

$$\therefore 6420 = \frac{7x + 510000 - 5x}{100}$$

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

∴ 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 ₹ 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%.

∴ 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 .....(i)

Commission on first car = $2,40,000 \times \frac{17.5}{100}$ = ₹ 42000 .....(ii)

Commission on second car = $2,22,000 \times \frac{12.5}{100}$ = ₹ 27750 .... (iii)

Let rate of commission on third car be x%.

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

Total commission = Commission on first car + Commission on second car + Commission on third car

∴ From (i), (ii), (iii) and (iv),

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

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

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

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

$$\therefore x = \frac{26,430 \times 100}{225000}$$

∴ x = 11.75%

∴ Rate of commission on third car is 11.75%.

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 = $x \times \frac{15}{100} = 0.15x$

$\therefore$ 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

$\therefore$ Net selling price = 0.85x – 0.0425x = 0.8075x

However, net selling price is ₹ 38,356.25.

$\therefore$ 0.8075 x = 38,356.25

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

$\therefore$ x = ₹ 47,500

$\therefore$ 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

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

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

$$\therefore x = 10,200$$

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

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.

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.

$$\therefore 0.8832x = 8832$$

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

∴ x = ₹ 10000

∴ Marked price (list price) ₹ 10,000.

Retailer has made 38% profit on cost price.

Let the cost price be y.

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

Cost price + Profit = Selling price

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

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

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

$$\therefore y = \frac{8,832 \times 100}{138} = ₹\ 6400$$

∴ 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

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

= ₹ 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.

∴ Trade discount = 25% of List price

= 25% of ₹ 1,600

$$= \frac{25}{100} \times 1600 = ₹\ 400$$

Invoice Price = List price – Trade discount

= 1,600 – 400 = ₹ 1,200

Also, the wholesaler allows 5% cash discount

∴ Cash discount = 5% of invoice price

= 5% of ₹ 1,200

$$= \frac{5}{100} \times 1200 = ₹\ 60$$

∵ 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. + $\left(\frac{\text{P.W.} \times \text{n} \times \text{r}}{100}\right)$

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

$\therefore$ 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. $\left(\frac{104}{100}\right)$

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

$\therefore$ 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.

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

$= \frac{8000 \times \frac{4}{12} \times 12.5}{100}$

$= \frac{8000 \times 4.17}{100}$

= ₹ 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) = $\frac{8}{12}$ years

r = 12%

To find Present Worth (P.W.)

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

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

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

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

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

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

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

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

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

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

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

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

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

∴ 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 ₹ x.

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

∴ P.W. of 20 books = 20x,

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

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

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

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

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

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

∴ 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,

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

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

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

$$= \frac{4,240 \times 9}{100 \times 2}$$

∴ 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.

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

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

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

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

∴ x = ₹ 182.58

∴ T.D. = ₹ 182.58 ≈ ₹ 182.60

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

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

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

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

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

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

$$\therefore r = 6\%$$

$\therefore$ 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	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.

$$\therefore \text{B.D.} = \frac{6,395 \times 206 \times 8}{365 \times 100}$$

$$\therefore \text{B.D.} = = 288.74$$

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

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 = 5th September 1998

Legal due date = 8th September 1998

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

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

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

∴ n = 146 days

∴ 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 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

∴ Nominal due date = 5th December

Legal due date = 8th 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:

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.

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

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

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

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

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

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

$$x = ₹\ 43,800$$

∴ 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,

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

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

$$\therefore n = \frac{70 \times 100 \times 365}{7000 \times 5}$$

$$\therefore n = 73$$

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

∴ Legal due date = 17th September

∴ Nominal due date = 17 – 3 = 14th 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.

∴ B.G. = ₹ 20

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.

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

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

∴ x = ₹ 1,200

∴ True discount is ₹ 1,200.

∴ B.G. = B.D. – T.D.

∴ 20 = B.D. – 1,200

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

$\therefore$ 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 ₹ y

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

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

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

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

$\therefore$ 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.

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,

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

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

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

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

$\therefore$ S.D. = P.W. + 0.02 P.W. ...[From (i)]

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

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

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

Since T.D. = 0.02 × P.W.

= 0.02 × 50000

= ₹ 1000

$\therefore$ True discount is ₹ 1,000

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

$$= \frac{1000 \times \frac{146}{365} \times 5}{100}$$

= ₹ 20

$\therefore$ 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:

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

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

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

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

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

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

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

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

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

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

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

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

Since,

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

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

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

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

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

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

$$\therefore \text{F.V.} = 10992 \times \frac{500}{458}$$

$$\therefore \text{F.V.} = 12000$$

∴ 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 **Catalogue/list** 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 **Commercial Discount**.

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 **higher** 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, **Trade** discount is first calculated on **Catalogue/list** price.

Miscellaneous Exercise 1 | Q 2.1 | Page 12

Fill in the Blanks.

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

Solution: **Invoice Price** = 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

$$= \frac{6.5}{100} \times 75,000$$

= 4,875

Bonus = 1% on sales over 50,000

= 1% (75,000 – 50,000)

$$= \frac{1}{100} \times 25,000$$

= 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

$\therefore 73,125 = x \times \frac{3}{4}\%$

$\therefore 73,125 = x \times \frac{0.75}{100}\ \%$

$\therefore x = \frac{73,125 \times 100}{0.75}$

$\therefore x = 97,50,000$

∴ 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 → 130

? → 97,50,000

$\therefore$ 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% × 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

$$\therefore (x - 93,750) = 3,750 + \frac{5}{100} \times (x - 50,000)$$

$$\therefore (x - 93,750) \times 100 = 3,750 \times 100 + 5(x - 50,000)$$

∴ 100x – 93,75,000 = 3,75,000 + 5x – 2,50,000

∴ 100x – 5x = 1,25,000 + 93,75,000

∴ 95x = 95,00,000

$$\therefore x = \frac{95,00,000}{95}$$

∴ x = 1,00,000

∴ 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

$$\text{True discount} = \frac{\text{P.W.} \times \text{n} \times \text{r}}{100}$$

$$660 = \frac{11,000 \times \frac{9}{12} \times \text{r}}{100}$$

$$660 \times 100 = 11,000 \times \frac{9}{12} \times \text{r}$$

$$\therefore r = \frac{660 \times 100 \times 12}{11,000 \times 9}$$

∴ r = 8%

∴ 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

(-) (-) (-)

1,200 = commission on 12,000

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

= 10 % p.a.

$\therefore$ Commission on sales of ₹ 96,000

$= 96,000 \times \frac{10}{100}$ = ₹ 9,600

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

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

$\therefore$ 17,600 = Salary + 9,600

$\therefore$ 17,600 – 9,600 = Salary

$\therefore$ 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

$= 5,500 - 5,500 \times \frac{15}{100}$

= 5,500 - 825

= ₹ 4,675

Freight charges are at $2\frac{1}{2}$% which is 2.5% of catalogue price

$\therefore$ Freight = $5,500 \times \frac{2.5}{100}$ = ₹ 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 = 6th August

Date of bill discounting = 25th May

Number of days from bill discounting date to legal due date

May	June	July	August	Total
6	30	31	6	73 days

$$\therefore \text{True discount (T.D.)} = \frac{\text{P.W.} \times \text{n} \times \text{r}}{100}$$

$$= \frac{\text{P.W.} \times \frac{73}{365} \times 5.5}{100}$$

$$\therefore \text{T.D.} = \frac{1.1\ \text{P.W.}}{100} \quad \text{...(i)}$$

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

$$\therefore 7,000 = \text{P.W.} + \frac{1.1\ \text{P.W.}}{100} \quad \text{....[From (i)]}$$

$$\therefore 7,000 = \frac{100\ \text{P.W} + 1.1\ \text{P.W.}}{100}$$

$$\therefore 7,000 \times 100 = 101.1\ \text{P.W.}$$

$$\therefore \text{P.W.} = \frac{7,00,000}{101.1}$$

$$\therefore \text{P.W.} = 6923.83 \cong ₹\ 6,923$$

∴ 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 = 14th April 2005,

Date of discount = 6th 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.

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

$$\text{i.e., } 35 = \frac{3,500 \times \text{n} \times 5}{100}$$

$$\text{i.e., } 35 = 35 \times \text{n} \times 5$$

$$\text{i.e., } 5\text{n} = 1$$

$$\text{i.e., n} = \frac{1}{5} \text{ year} = \frac{1}{5} \times 365 = 73 \text{ days}$$

∴ 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

∴ 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,

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

r = 4% p.a.

Since, B.G. = B.D. – T.D.

∴ B.G. = ₹ 80

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

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

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

∴ T.D. = ₹ 4000

∴ True discount is ₹ 4,000

Also, B.G. = B.D. – x

∴ 80 = B.D. - 4,000

∴ B.D. = 4,000 + 80

∴ B.D. = ₹ 4,080

∴ Banker's discount is ₹ 4,080.

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

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

$$\therefore 4080 = \frac{\text{F.V} \times \frac{1}{2} \times 4}{100}$$

$$\therefore 4080 \times 100 = \text{F.V.} \times 2$$

$$\therefore \text{F.V.} = \frac{4080 \times 100}{2}$$

∴ 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

= 100 - 35 = ₹ 65

Also, he gets 30% profit on cost price.

Let the cost price be ₹ x

∵ Selling price = Cost price + Profit

∴ 65 = x + 30% of ₹ x

$$\therefore 65 = x + \frac{30}{100} \times x$$

$$\therefore 65 = \frac{100x + 30x}{100}$$

$$\therefore 65 = \frac{130x}{100}$$

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

∴ x = ₹ 50

∴ 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 + 20% of ₹ 50

$$= 50 + \frac{20}{100} \times 50 = 50 + 10$$

∴ 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

$$= 60 + \frac{30}{100} \times 60$$

= 60 + 18

∴ New selling price = ₹ 78

But, here the list price remains the same.

∴ New selling price = List price – New discount

∴ 78 = 100 – New discount

∴ New discount = 100 – 78

∴ New discount = ₹ 22

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

$$= \frac{22}{100} \times 100 = 22\%$$

∴ 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.

∴ Trade discount = 25% of catalogue price

= 25% of ₹ 100

$$= \frac{25}{100} \times 100$$

∴ 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

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

∴ 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,

∴ Nominal due date = 9th September 2006,

Legal due date = 12th September 2006,

Date of discount = 19th April 2006

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

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

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

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

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

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

$$= \frac{4800 \times \frac{2}{5} \times \frac{25}{4}}{100}$$

$$= \frac{4800 \times 2 \times 25}{100 \times 5 \times 4}$$

$\therefore$ B.D. = ₹ 120

Also, B.D. = F.V. – C.V.

$\therefore$ 120 = 4,800 – C.V.

$\therefore$ C.V. = 4,800 – 120

$\therefore$ C.V. = ₹ 4,680

$\therefore$ 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 = 10th July

Period of the bill = 6 months

$\therefore$ Nominal due date = 10th January

Legal due date = 13th 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 %

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

$$\therefore 540 = \frac{65700 \times \text{n} \times 5}{100x365}$$

$$\therefore \text{n} = \frac{540 \times 365 \times 100}{65700 \times 5}$$

∴ 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 ₹ 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

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

= ₹ 1,500

Also, he charged 2% commission to the buyer.

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

= 2% of ₹ 50,000

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

= ₹ 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.

∴ 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

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

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

∴ 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.