

$$\begin{aligned} \text{B.D.} &= \text{S.I. on Rs. 6000 for } 1/5 \text{ year} \\ &= \text{Rs. } (6000 \times 10 \times 1/5 \times 1/100) = \text{Rs. 120.} \end{aligned}$$

$$\begin{aligned} \text{T.D.} &= \text{Rs. } [(6000 \times 10 \times 1/5) / (100 + (10 \times 1/5))] \\ &= \text{Rs. } (12000 / 102) = \text{Rs. 117.64.} \end{aligned}$$

$$\text{B.G.} = (\text{B.D.}) - (\text{T.D.}) = \text{Rs. } (120 - 117.64) = \text{Rs. 2.36.}$$

$$\begin{aligned} \text{Money received by the holder of the bill} &= \text{Rs. } (6000 - 120) \\ &= \text{Rs. 5880.} \end{aligned}$$

Ex. 2. If the true discount on a certain sum due 6 months hence at 15% is Rs. 120, what is the banker's discount on the same sum for the same time and at the same rate?

$$\begin{aligned} \text{Sol. } \text{B.G.} &= \text{S.I. on T.D.} \\ &= \text{Rs. } (120 \times 15 \times 1/2 \times 1/100) \\ &= \text{Rs. 9.} \end{aligned}$$

$$(\text{B.D.}) - (\text{T.D.}) = \text{Rs. 9.}$$

$$\text{B.D.} = \text{Rs. } (120 + 9) = \text{Rs. 129.}$$

Ex. 3. The banker's discount on Rs. 1800 at 12% per annum is equal to the true discount on Rs. 1872 for the same time at the same rate. Find the time.

Sol.

$$\text{S.I. on Rs. 1800} = \text{T.D. on Rs. 1872.}$$

$$\text{P.W. of Rs. 1872 is Rs. 1800.}$$

$$\text{Rs. 72 is S.I. on Rs. 1800 at 12\%.}$$

$$\text{Time} = [(100 \times 72) / (12 \times 1800)] \text{ year}$$

$$1/3 \text{ year} = 4 \text{ months.}$$

Ex. 4. The banker's discount and the true discount on a sum of money due 8 months hence are Rs. 120 and Rs. 110 respectively. Find the sum and the rate percent.

Sol.

$$\begin{aligned} \text{Sum} &= [(\text{B.D.} \times \text{T.D.}) / (\text{B.D.} - \text{T.D.})] \\ &= \text{Rs. } [(120 \times 110) / (120 - 110)] \\ &= \text{Rs. 1320.} \end{aligned}$$

$$\text{Since B.D. is S.I. on sum due, so S.I. on Rs. 1320 for 8 months is Rs. 120.}$$

$$\begin{aligned} \text{Rate} &= [(100 \times 120) / (1320 \times 2/3)]\% \\ &= 13 \frac{7}{11}\%. \end{aligned}$$

Ex. 5. The present worth of a bill due sometime hence is Rs. 1100 and the true discount on the bill is Rs. 110. Find the banker's discount and the banker's gain.

$$\text{Sol. } \text{T.D.} = \sqrt{\text{P.W.} \times \text{B.G.}}$$

$$\begin{aligned} \text{B.G.} &= (\text{T.D.})^2 / \text{P.W.} \\ &= \text{Rs. } [(110 \times 110) / 1100] \end{aligned}$$

= Rs. 11.

B.D. = (T.D. + B.G.) = Rs. (110 + 11) = Rs. 121.

Ex. 6. The banker's discount on Rs. 1650 due a certain time hence is Rs. 165. Find the true discount and the banker's gain.

Sol.

$$\text{Sum} = \frac{(\text{B.D.} \times \text{T.D.})}{(\text{B.D.} - \text{T.D.})}$$

$$= \frac{(\text{B.D.} \times \text{T.D.})}{\text{B.G.}}$$

$$\text{T.D./B.G.} = \text{Sum/ B.D.}$$

$$= 1650/165$$

$$= 10/1$$

Thus, if B.G. is Re 1, T.D. = Rs. 10.

If B.D. is Rs. 11, T.D. = Rs. 10.

If B.D. is Rs. 165, T.D. = Rs. $[(10/11) \times 165]$

$$= \text{Rs. } 150$$

And, B.G. = Rs. (165 - 150) = Rs. 15.

Ex. 7. What rate percent does a man get for his money when in discounting a bill due 10 months hence, he deducts 10% of the amount of the bill?

Solution: Let amount of the bill = Rs. 100

Money deducted = Rs. 10

Money received by the holder of the bill = Rs. 100 - 10 = Rs. 90

SI on Rs. 90 for 10 months = Rs. 10

Rate = $[(100 \times 10) / (90 \times 10 / 12)]\% = 13 \frac{1}{3}\%$

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