

ASSIGNMENT-10

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1 QUESTION No-2.13(MATRICES)

The bookshop of a particular school has 10 dozen chemistry books, 8 dozen physics books, 10 dozen economics books. Their selling prices are ₹80, ₹60 and ₹40 each respectively. Find the total amount the bookshop will receive from selling all the books using matrix algebra.

2 SOLUTION

Given that the bookshop has 10 dozen chemistry books, 8 dozen physics books, and 10 dozen economics books. Let \mathbf{A} denote the total books in the bookshop,

$$\mathbf{A} = 12 \begin{pmatrix} 10 \\ 8 \\ 10 \end{pmatrix} \quad (2.0.1)$$

$$= \begin{pmatrix} 120 \\ 96 \\ 120 \end{pmatrix} \quad (2.0.2)$$

Given that Selling price of each chemistry, physics and economics book is ₹80, ₹60 and ₹40 respectively. Let \mathbf{B} denote the selling price of each books,

$$\mathbf{B} = \begin{pmatrix} 80 \\ 60 \\ 40 \end{pmatrix}. \quad (2.0.3)$$

The total amount received by the bookshop after selling the books is given by,

$$\mathbf{A}^T \mathbf{B} = \begin{pmatrix} 120 & 96 & 120 \end{pmatrix} \begin{pmatrix} 80 \\ 60 \\ 40 \end{pmatrix} = 20160 \quad (2.0.4)$$

Hence the total amount received by the bookshop after selling the books is ₹20160.