Solution to Q12.13.3.89

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Question: For the following probability distribution

X	1	2	3	4
P(X)	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{3}{10}$	$\frac{2}{5}$

TABLE 0
Probability Distribution

E(X^2)is equal to
(A)3 (B)5 (C)7 (D)10
Solution: As we know

$$E\left(X^2\right) = \sum_{k=1}^{4} k^2 p_X(k) \tag{1}$$

$$= (1)^2 \times \frac{1}{10} + (2)^2 \times \frac{1}{5} + (3)^2 \times \frac{3}{10} + (4)^2 \times \frac{2}{5} \tag{2}$$

$$= \frac{1}{10} + \frac{4}{5} + \frac{27}{10} + \frac{32}{5} \tag{3}$$

$$= 10 \tag{4}$$

$$\therefore E\left(X^2\right) = 10 \tag{5}$$