Solution of question 12.13.3.87

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Question: The probability distribution of a discrete random variable X is given below. The value of k is equal to:

X	2	3	4	5
P(X)	$\frac{5}{k}$	$\frac{7}{k}$	$\frac{9}{k}$	$\frac{11}{k}$

(a) 8
(b) 16
(c) 32
(d) 48

Solution: We know that the sum of probabilities for all the values of random variable is equal to 1. Hence,

$$\sum_{i=2}^{5} P(X_i) = 1 \tag{1}$$

$$\implies \frac{5}{k} + \frac{7}{k} + \frac{9}{k} + \frac{11}{k} = 1 \tag{2}$$

$$\frac{5+7+9+11}{k} = 1 \tag{3}$$

$$\frac{32}{k} = 1 \tag{4}$$

$$k = 32 \tag{5}$$

Hence, option (c) is correct.