

Statistics Ex 7.1 Q8

Answer:

Given

x_i	15	17	19	20 + p	23
f_i	2	3	4	5 <i>p</i>	6

Mean = 20

First of all prepare the frequency table in such a way that its first column consist of the values of the variate (x_i) and the second column the corresponding frequencies (f_i) .

Thereafter multiply the frequency of each row with corresponding values of variable to obtain third column containing $(f_i x_i)$.

Then, sum of all entries in the column second and denoted by $\sum f_i$ and in the third column to obtain $\sum f_i x_i$.

x_i	f_i	$f_i x_i$
15	2	30
17	3	51
19	4	76
20 + p	5 <i>p</i>	5p(20+p)
23	6	138
13	$\sum_{i} f_{i} = 15 + 5p$	$\sum f_i x_i = 295 + 5p(20 + p)$

We know that mean,
$$\overline{X} = \frac{\sum f_i x_i}{\sum f_i}$$

$$20 = \frac{295 + 5p(20 + p)}{15 + 5p}$$

By using cross multiplication method,

$$5p^2 + 100p + 295 = 300 + 100p$$

 $\Rightarrow 5p^2 = 300 - 295 = 5$
 $\Rightarrow p^2 = 1$
 $\Rightarrow p = 1$
Hence, $p = 1$

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