Statistics Ex 7.1 Q11

Answer :

Given:

no. of heads per toss : x_i	0	1	2	3	4	5
No. of tosses : f_i	38	144	342	287	164	25

First of all prepare the frequency table in such a way that its first column consist of the numnber of heads per tosses (x_i) and the second column the corresponding number of tosses (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 denote by $\sum f_i x_i$ and in the third column to obtain $\sum f_i x_i$.

no. of heads per toss : x_i	No. of tosses : f_i	$f_i x_i$
0	38	0
1	144	144
2	342	684
3	287	861
4	164	656
5	25	125
	$\sum f_i = 1000$	$\sum f_i x_i = 2470$

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

$$= \frac{2470}{1000}$$

$$= 2.47$$

Hence, the mean number of heads per toss is 2.47.

Statistics Ex 7.1 Q12

Answer :

Given:

x_i	10	30	50	70	90
f_i	17	f_1	32	f_2	19

Mean $= 50$

First of all prepare the frequency table in such a way that its first column consists 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	$f_i x_i$
10	17	170
30	f_1	$30 f_1$
50	32	1600
70	f_2	$70 f_2$
90	19	1710
	$\sum f_i = 68 + f_1 + f_2$	$\sum f_i x_i = 3480 + 30 f_1 + 70 f_2$

Now,

$68 + f_1 + f_2 = 120$

$f_1 + f_2 = 120 - 68$

$f_1 = 52 - f_2$ ..... (1)

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

$$50 = \frac{3480 + 30f_1 + 70f_2}{120}$$

By using cross multiplication method,

$$6000 = 3480 + 30f_1 + 70f_2$$

$$6000 - 3480 = 30f_1 + 70f_2$$

$$2520 = 30f_1 + 70f_2$$

$$252 = 3f_1 + 7f_2 \quad \text{..... (2)}$$

Putting the value of f_1 from equation (1) in (2), we get

$$252 = 3(52 - f_2) + 7f_2$$

$$= 156 - 3f_2 + 7f_2$$

$$252 - 156 = 4f_2$$

$$96 = 4f_2$$

Therefore,

$$f_2 = \frac{96}{4}$$

$$= 24$$

Putting the value of f_2 in equation (1), we get

$$f_1 = 52 - 24$$

$$= 28$$

Hence, $\boxed{f_1 = 28 \text{ and } f_2 = 24}$

********** END **********