PRACTICAL NUMBER 6

**Calculation of first four raw and central moments**

**FORMULA USED:**

1. **MOMENTS:**

**=**

For central moments A=mean.

**Question 1:** Calculate the first four central moments of the following data:

|  |  |
| --- | --- |
| X | F |
| 0 | 1 |
| 1 | 8 |
| 2 | 28 |
| 3 | 56 |
| 4 | 70 |
| 5 | 56 |
| 6 | 28 |
| 7 | 8 |
| 8 | 1 |

Ans:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| X | F | XIFI | X-M | FI(XI-M) | FI(XI-M)^3 | FI(XI-M)^2 | FI(XI-M)^4 |
| 0 | 1 | 0 | -4 | -4 | -64 | 16 | 256 |
| 1 | 8 | 8 | -3 | -24 | -216 | 72 | 648 |
| 2 | 28 | 56 | -2 | -56 | -224 | 112 | 448 |
| 3 | 56 | 168 | -1 | -56 | -56 | 56 | 56 |
| 4 | 70 | 280 | 0 | 0 | 0 | 0 | 0 |
| 5 | 56 | 280 | 1 | 56 | 56 | 56 | 56 |
| 6 | 28 | 168 | 2 | 56 | 224 | 112 | 448 |
| 7 | 8 | 56 | 3 | 24 | 216 | 72 | 648 |
| 8 | 1 | 8 | 4 | 4 | 64 | 16 | 256 |
|  | 256 | 1024 |  | 0 | 0 | 512 | 2816 |

**MEAN**=4

**MOMENT 1**= 0

**MOMENT 2**= 2

**MOMENT 3**= 0

**MOMENT 4=** 11

**Question 2**: Calculate the first four raw moments of the following data about any arbitrary point say 5:

|  |  |
| --- | --- |
| X | F |
| 0 | 1 |
| 1 | 8 |
| 2 | 28 |
| 3 | 56 |
| 4 | 70 |
| 5 | 56 |
| 6 | 28 |
| 7 | 8 |
| 8 | 1 |
|  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | F | X-5 | FI(XI-5) | FI(XI-5)^2 | FI(XI-5)^3 | FI(XI-5)^4 |
| 0 | 1 | -5 | -5 | 25 | -125 | 625 |
| 1 | 8 | -4 | -32 | 128 | -512 | 2048 |
| 2 | 28 | -3 | -84 | 252 | -756 | 2268 |
| 3 | 56 | -2 | -112 | 224 | -448 | 896 |
| 4 | 70 | -1 | -70 | 70 | -70 | 70 |
| 5 | 56 | 0 | 0 | 0 | 0 | 0 |
| 6 | 28 | 1 | 28 | 28 | 28 | 28 |
| 7 | 8 | 2 | 16 | 32 | 64 | 128 |
| 8 | 1 | 3 | 3 | 9 | 27 | 81 |
|  | 256 |  | -256 | 768 | -1792 | 6144 |

**MOMENT 1=**-1

**MOMENT 2=**3

**MOMENT 3=**-7

**MOMENT 4=**24