STATISTICS

1. Consider the given data with frequency distribution **[JEE(Advanced) 2023]**

x_i	3	8	11	10	5	4
f_i	5	2	3	2	4	4

Match each entry in **List-I** to the correct entries in **List-II.**

List-I	**List-II**
(P) The mean of the above data is	(1) 2.5
(Q) The median of the above data is	(2) 5
(R) The mean deviation about the mean of the above data is	(3) 6
(S) The mean deviation about the median of the above data is	(4) 2.7
	(5) 2.4

The correct option is :

(A) (P) $\rightarrow$ (3) (Q) $\rightarrow$ (2) (R) $\rightarrow$ (4) (S) $\rightarrow$ (5)

(B) (P) $\rightarrow$ (3) (Q) $\rightarrow$ (2) (R) $\rightarrow$ (1) (S) $\rightarrow$ (5)

(C) (P) $\rightarrow$ (2) (Q) $\rightarrow$ (3) (R) $\rightarrow$ (4) (S) $\rightarrow$ (1)

(D) (P) $\rightarrow$ (3) (Q) $\rightarrow$ (3) (R) $\rightarrow$ (5) (S) $\rightarrow$ (5)

SOLUTIONS

1. Ans. (A)

Sol.

x_i	3	4	5	8	10	11
f_i	5	4	4	2	2	3

(P) Mean

(Q) Median

(R) Mean deviation about mean

(S) Mean deviation about median

x_i	f_i	x_if_i	C.F.	$\|x_i - \text{Mean}\|$
3	5	15	5	3
4	4	16	9	2
5	4	20	13	1
8	2	16	15	2
10	2	20	17	4
11	3	33	20	5
	$\Sigma f_i = 20$	$\Sigma x_if_i = 120$		

$f_i\|x_i - \text{Mean}\|$	$\|x_i - \text{Median}\|$	$f_i\|x_i - \text{Median}\|$
15	2	10
8	1	4
4	0	0
4	3	6
8	5	10
15	6	18
$\Sigma f_i\|x_i - \text{Mean}\| = 54$		$\Sigma f_i\|x_i - \text{Median}\| = 48$

(P) $\text{Mean} = \dfrac{\Sigma x_i f_i}{\Sigma f_i} = \dfrac{120}{20} = 6$

(Q) $\text{Median} = \left(\dfrac{20}{2}\right)^{\text{th}}$

observation = 10^{th} observation = 5

(R) Mean deviation about mean

$= \dfrac{\Sigma f_i \left|x_i - \text{Mean}\right|}{\Sigma f_i} = \dfrac{54}{20} = 2.70$

(S) Mean deviation about median

$= \dfrac{\Sigma f_i \left|x_i - \text{Median}\right|}{\Sigma f_i} = \dfrac{48}{20} = 2.40$