Find the mean of following frequency distribution -

Class interval	0-10	10-20	20-30	30-40	40-50
no. of workers	7	10	15	8	10

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Class interval	mean (mid value) x_i	frequency f_i	$d_i = x_i - 25$	$v_i = \frac{d_i}{h}$	$f_i v_i$
0-10	5	7	-20	-2	-14
10-20	15	10	-10	-1	-10
20-30	25 = A	15	0	0	0
30-40	35	8	10	1	8
40-50	45	10	20	2	20

$h = 10$

$N = \Sigma f_i = 50$

$\Sigma f_i v_i = 4$

$\therefore$

$$\text{mean} = A + h\left(\frac{1}{N}\Sigma f_i u_i\right)$$

$$= 25 + 10\left(\frac{1}{50} \cdot 4\right)$$

$$= 25 + 0.8$$

$$= 25.8$$

Find mean

Class	0-20	20-40	40-60	60-80	80-100
frequency	15	18	21	29	17

Class	mid(x_i)	freq	$d_i = x_i - 50$	$u_i = d_i/h$	$f_i u_i$
0-20	10	15	-40	-2	-30
20-40	30	18	-20	-1	-18
40-60	50 = A	21	0	0	0
60-80	70	29	20	1	29
80-100	90	17	40	2	34
		$N = \Sigma f_i = 100$			$\Sigma f_i u_i = 15$

$h = 20$

$\text{mean} = 50 + \frac{15 \cdot 20}{100} = 53$

Find median

x	1	2	3	4	5	6	7	8	9
f	8	10	11	16	20	25	15	9	6

x	f_i	c.f
1	8	8
2	10	18
3	11	29
4	16	45
median = 5	20	65
6	25	90
7	15	105
8	9	114
9	6	120

$N = \Sigma f_i = 120$

$\frac{N}{2} = 60$

(1st जो बड़ी c.f = 65

median = ?

median

No. of absent Student	5	6	7	8	9	10	11	12	13	15	18	20
No. of days	1	5	11	14	16	13	10	70	4	1	1	1
C.f	1	6	17	31	47	60	70	140	144	145	146	147

$N = \Sigma f$

$= 147$

$\frac{N}{2} = \frac{147}{2} = 73.5$

If the median of the distribution given below is 28.5 find x & y

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	
No of students	5	x	20	15	y	5	$\Sigma f_i = 60$
c.f.	5	5+x	25+x	40+x	40+x+y	45+x+y	

median = 28.5

median class

L = 20

h = 10

f = 20

F = 5+x

$$\text{median} = l + \left(\frac{\frac{N}{2} - F}{f}\right) h$$

$$28.5 = 20 + \frac{30-5-x}{20} \times 10$$

$$17 = 25 - x$$

$$x = 8$$

$$y = 7$$

$$x + y = 15$$

The median of the following data in 525. If the sum of the frequencies is 100, find the value of x and y.

525 में निम्नलिखित आँकड़ों की माध्यिका। यदि बारंबारताओं का योग 100 हो, तो x और y का मान ज्ञात कीजिए।

Class Intervals	Freqeuency
0 - 10	2
100 - 200	5
200 – 300	x
300 - 400	12
400 - 500	17
500 - 600	20
600 - 700	y
700 - 800	9
800 - 900	7
900 - 1000	4

(a) x = 46, y = 7 (b) x = 7, y = 46

(c) x = 46.25, y = 7.5 (d) None of the above

$$\text{median} = L + \left(\frac{\frac{N}{2} - F}{f}\right) \cdot h$$

$$525 = 500 + \left(\frac{50 - 36 - x}{20}\right) 5 \times 100$$

$$5 = 14 - x$$

$$x = 9$$

c.f

2

7

$7+x$

$19+x$

$36+x = F$

$56+x$

$56+x+4$

$65+x+4$

$72+x+4$

$76+x+4 = 100$

$x+4 = 24$

$y = 15$

Calculate mean deviation about mean.

x_i	3	9	17	23	27
f_i	8	10	12	9	5

x_i	f_i	$x_i f_i$	$\lvert x_i - \bar{x}\rvert = \lvert x_i - 15\rvert$	$f_i \lvert x_i - \bar{x}\rvert$
3	8	24	12	96
9	10	90	6	60
17	12	204	2	24
23	9	207	8	72
27	5	135	12	60
	$N = \Sigma f_i = 44$	$\Sigma f_i x_i = 660$		$\Sigma f_i \lvert x_i - \bar{x}\rvert = 312$

$$\text{mean} = \bar{x} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{660}{44} = 15$$

$$M.D(\bar{x}) = \frac{1}{N} \Sigma f_i \lvert x_i - \bar{x}\rvert$$

$$= \frac{312}{44} = 7.09$$

Mean deviation about median

x_i	10	15	20	25	30	35	40	45
f_i	7	3	8	5	6	8	4	9

x_i	f_i	c.f	$\lvert x_i - M \rvert = d_i$	$f_i d_i$
10	7	7	20	140
15	3	10	15	45
20	8	18	10	80
25	5	23	5	25
30	6	29	0	0
35	8		5	40
40	4		10	40
45	9		15	135

Median = 30

$N = \Sigma f_i = 50 \quad N/2 = 25$

$\Sigma f_i d_i = 505$

$$M.D(M) = \frac{1}{N} \Sigma f_i d_i$$

$$= \frac{505}{50}$$

$$= 10.1$$

Find M.D(M)

$l = 12$ $h = 6$

Class	0-6	6-12	12-18	18-24	24-30
Frequency	8	10	$f = 12$	9	5
mid value x_i	3	9	15	21	27
cf	8	$F = 18$	30	39	44
$\lvert x_i - 14 \rvert$	11	5	1	7	13
$f_i \lvert x_i - 14 \rvert$	88	50	12	63	65

median class

$N = \Sigma f_i = 44$

$\frac{N}{2} = \frac{44}{2} = 22$

$\text{median} = l + \frac{\frac{N}{2} - F}{f} \cdot h$

$= 12 + \frac{22 - 18}{12} \cdot 6$

$= 14$

$M(D)(m) = \frac{1}{N} \Sigma f_i \lvert x_i - 14 \rvert = \frac{278}{44} = \frac{139}{22} = 6.318$

$\Sigma f_i \lvert x_i - 14 \rvert = 278$

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