VIDYA BHAWAN, BALIKA VIDYAPITH

Shakti Utthan Ashram, Lakhisarai-811311(Bihar)
(Affiliated to CBSE up to +2 Level)

Class: X **Subject:Mathematics** **Date: 03.01.2021**

Question-3

New Page 2 Find the mean marks from the following data:

Marks	Number of Students
Below 10	5
Below 20	9
Below 30	17
Below 40	29
Below 50	45
Below 60	60
Below 70	70
Below 80	78
Below 90	83
Below 100	85

Marks	Number of Students (f_i)	Mid-point (x_i)	Deviation $u_i = (x_i - 55)/10$	f_iu_i
0 - 10	5	5	-5	-25
10 - 20	9 - 5 = 4	15	-4	-16
20 - 30	17 - 9 = 8	25	-3	-24
30 - 40	29 - 17 = 12	35	-2	-24
40 - 50	45 - 29 = 16	45	-1	-16
50 - 60	60 - 45 = 15	a = 55	0	0
60 - 70	70 - 60 = 10	65	1	10
70 - 80	78 - 70 = 8	75	2	16
80 - 90	83 - 78 = 5	85	3	15
90 - 100	85 - 83 = 2	95	4	8
Total	85			-56

Hence mean $\bar{x} = a + h \times \frac{1}{n}\sum_{i=1}^{10} f_i u_i$ [where h = 10]

$= 55 + 10 \times \frac{-56}{85} = 48.41$ marks

Question-6

Find the values of f_1 and f_2 of the frequency, if the mean of the following frequency distribution is 21.4 and the total frequency is 40.

Class-interval	0 - 8	8 - 16	16 - 24	24 - 32	32 - 40
Frequency	6	f_1	10	f_2	9

Solution:

Take a = 10 and h = 8.

Class interval	Mid-point x_i	f_i	$f_i x_i$
0 - 8	4	6	24
8 - 16	12	f_1	$12 f_1$
16 - 24	20	10	200
24 - 32	28	f_2	$28 f_2$
32 - 40	36	9	324
		$25 + f_1 + f_2 = 40$	$548 + 12 f_1 + 28 f_2$

$$f_1 + f_2 = 15 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (i)$$

$$\therefore \bar{x} = \frac{548 + 12f_1 + 28f_2}{40}$$

$$21.4 = \frac{548 + 12f_1 + 28f_2}{40}$$

$$856 = 548 + 12f_1 + 28f_2$$

$$12f_1 + 28f_2 = 308$$

$$3f_1 + 7f_2 = 77 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (ii)$$

(ii) - 3 × (i) ⇒

$$3f_1 + 7f_2 = 77$$

$$3f_1 + 3f_2 = 45$$

$$4f_2 = 32$$

$$f_2 = 8 \therefore f_1 = 15 - 8 = 7$$