

Assignment No : 02

Course : STA 201

Section : 05

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19/10/072

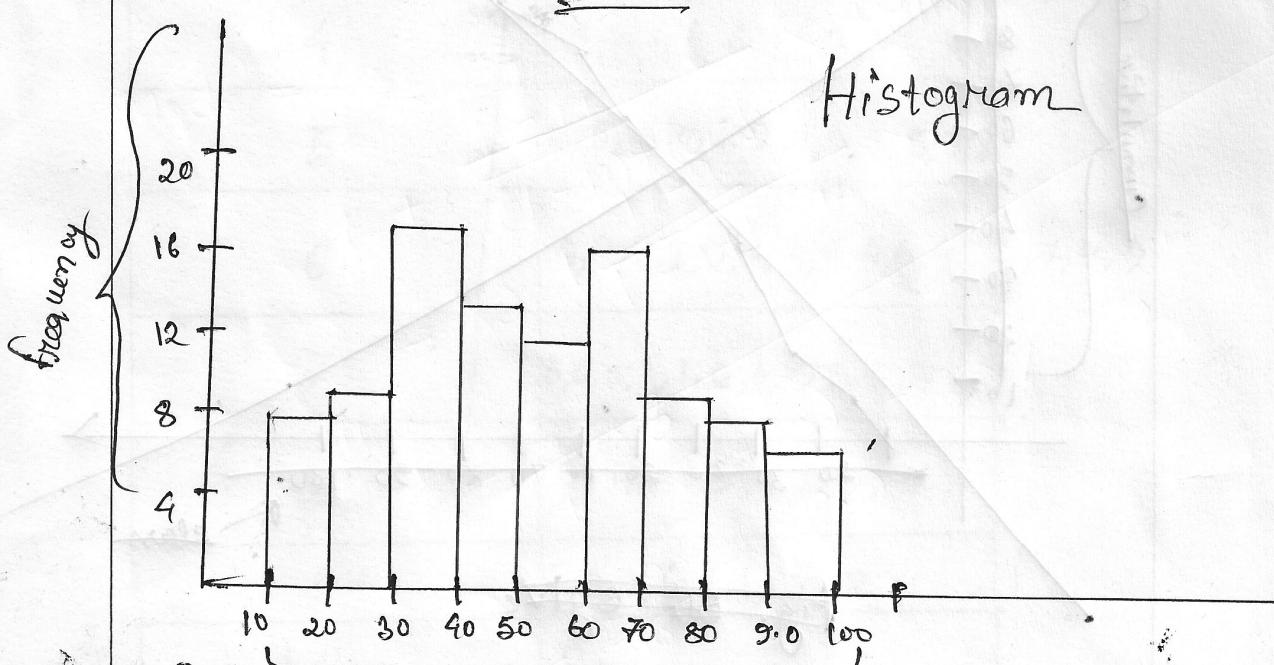
(1)

Ans. to the Q. No - 1

i

Class Interval	Mid Value (m_i)	Frequency (f_i)	Relative frequency	Cumulative Frequency	Cumulative Relative Frequency
10-20	15	8	0.08	8	0.08
20-30	25	9	0.09	17	0.17
30-40	35	17	0.17	34	0.34
40-50	45	14	0.14	48	0.48
50-60	55	12	0.12	60	0.60
60-70	65	16	0.16	76	0.76
70-80	75	9	0.09	85	0.85
80-90	85	8	0.08	93	0.93
90-100	95	2	0.02	100	1.00
Total		100	1.00		

ii



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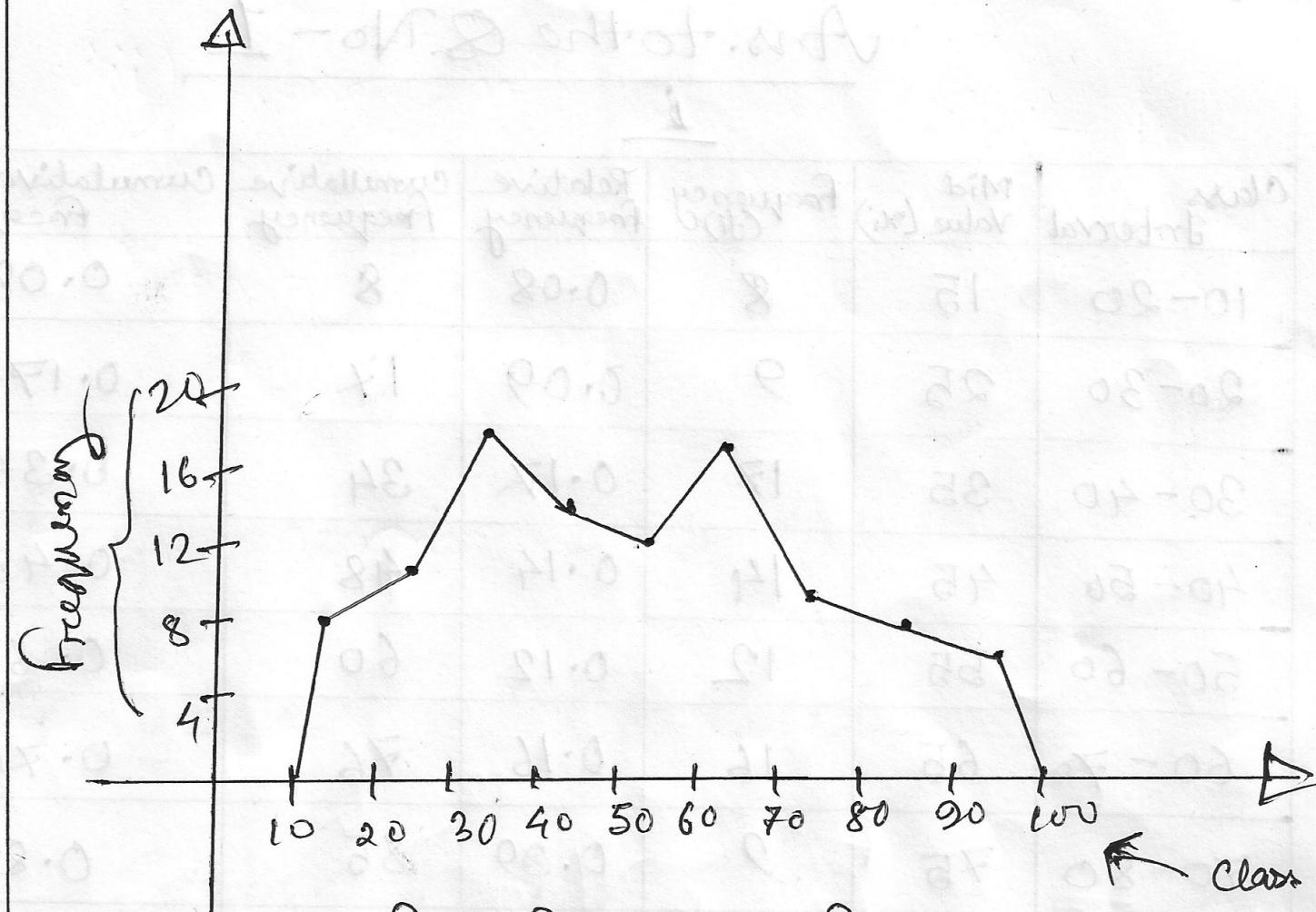


Fig: Frequency Polygon

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(3)

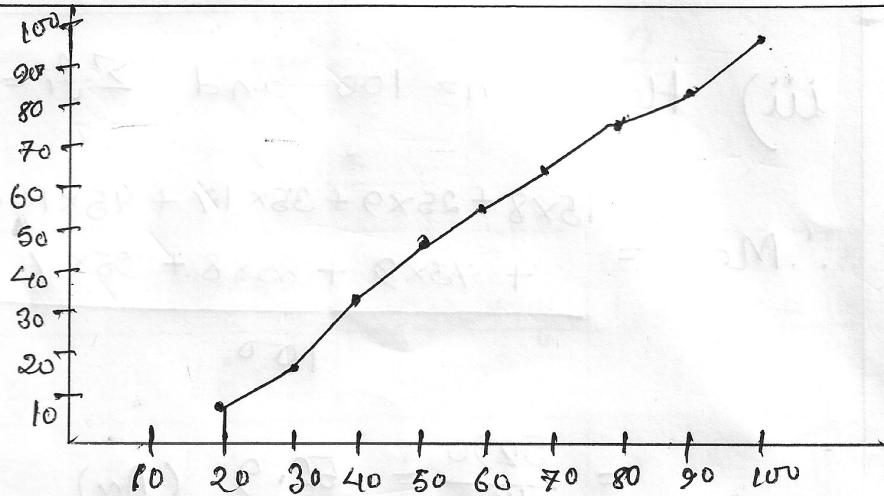


Fig: Ogive

Stem	Leaf
1	0, 2, 4, 3, 6, 8, 9,
2	2, 4, 5, 6, 8, 9,
3	0, 1, 2, 3, 4, 5, 1, 0, 0, 1, 1, 4, 5, 6, 7, 7, 9, 9, 9
4	1, 2, 0, 4, 4, 6, 1, 1, 3, 4, 5, 7, 7
5	2, 5, 0, 0, 1, 2, 2, 2, 3, 5, 7, 8
6	0, 0, 2, 3, 2, 4, 4, 7, 4, 4, 4, 6, 7, 7, 9
7	0, 0, 0, 1, 1, 2, 4, 7, 5, 5, 7
8	0, 1, 3, 9, 6, 7, 9,
9	1, 0, 0, 4, 1, 1, 7, 2
10	0,

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iii) Here, $n = 100$ and $\sum f_i = 100$

$$\therefore \text{Mean} = \frac{15 \times 8 + 25 \times 9 + 35 \times 17 + 45 \times 14 + 55 \times 12 + 65 \times 16 + 75 \times 9 + 85 \times 8 + 95 \times 7}{100}$$
$$= \frac{5290}{100} = 52.9 \text{ (Ans)}$$

Here, $L_o = 50$, $f_{mc} = 48$, $f_{me} = 12$, $n = 100$, $w_{mc} = 10$

$$\therefore \text{Median} = L_o + \left(\frac{n}{2} - F_{mc} \right) / f_{me} \times w_{mc}$$
$$= 50 + \left(\frac{100}{2} - 48 \right) / 12 \times 10$$
$$= 51.7$$
$$(\text{Ans})$$

$$\text{Mode} = L_o + \frac{f_0 - f_1}{(f_0 - f_1) + (f_1 - f_2)} \times w$$
$$= 30 + \frac{17 - 9}{17 - 9 + 17 - 14} \times 10$$
$$= 37.3$$
$$(\text{Ans})$$

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Ans. to the Q. No - 2i

Class Range	Frequency	Relative Frequency	Cumulative frequency	Relative Cumulative Frequency
85-95	16	0.32	16	0.32
95-105	17	0.34	33	0.66
105-115	11	0.22	44	0.88
115-125	6	0.12	50	1.00
Total		1.00		

ii

$$\text{Modal temperature} = l_0 + \frac{f_0 - f_1}{f_0 - f_1 + f_0 - f_2} \times w$$

$$= 95 + \frac{17 - 16}{17 - 16 + 17 - 11} \times 10$$

$$= 95 + \frac{1}{1+6} \times 10$$

$$= 96.43$$

(Ans.)

iii

$$\text{Proportion } \hat{\omega}^2 = \frac{29}{50} \times 100\% \\ = 58\%$$

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~~S - 011~~ ~~total marks~~

(Ans to Q No - 3)

$$\text{Mean} = \frac{45 \times 12 \times 900 + 37 \times 16 \times 1100 + 27 \times 6 \times 1300 + 30 \times 9 \times 1500 + 41 \times 7 \times 170}{45 \times 12 + 37 \times 16 + 27 \times 6 + 30 \times 9 + 41 \times 7}$$
$$= 1210.53 \quad (\text{Ans})$$

(Ans to Q No - 4)
value

$$\text{Total observations} = 250 \times 58 = 14500$$

Now, Correct observation value

$$= 14500 - 82 - 9 + 182 + 98$$
$$= 14689$$

$$\therefore \text{Correct mean} = \frac{14689}{250} = 58.756 \quad (\text{Ans})$$

(Ans to Q No - 5)

Let, male employee = n

female employee = $100 - n$

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Therefore,

$$5200n + 4200(100-n) = (5000 \times 100)$$

$$\Rightarrow 1500n = 500000 - 420000$$

$$\Rightarrow n = 80$$

$$\therefore \text{Male} = 80\%$$

$$\text{Female} = (100-80) = 20\%$$

(Ans)

Ans. to Q No - 6

i) Total money = $(250 \times 5) + (350 \times 9) + (450 \times 3) + (550 \times 3) + (650 \times 4)$
= 10250
(Ans)

ii) Average pension = $\frac{10250}{25} = 410$

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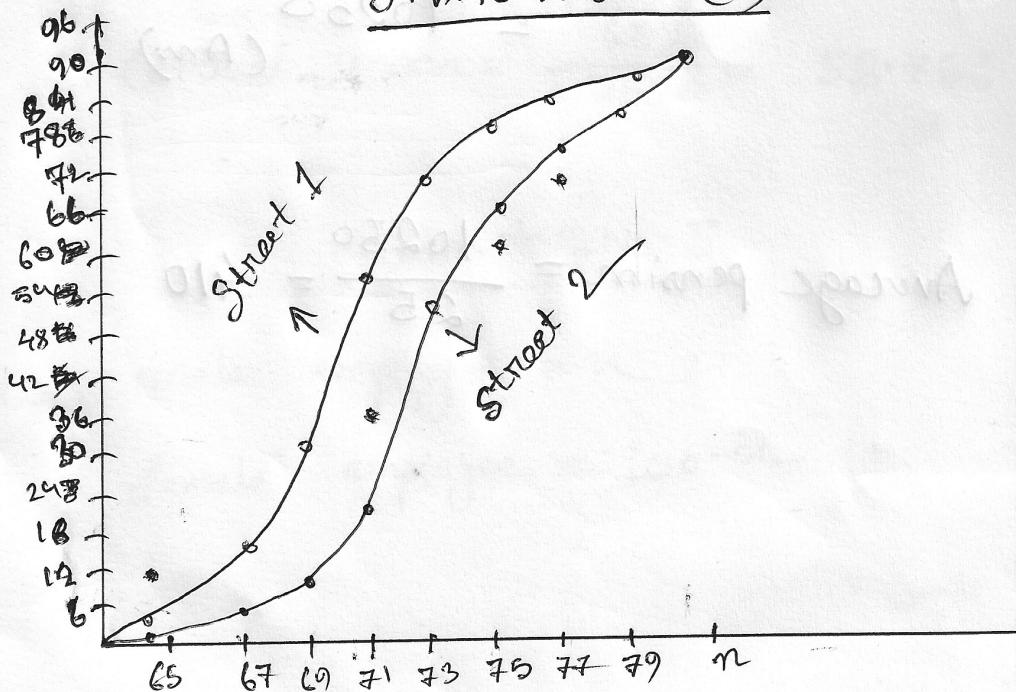
Class interval	f_i	x_i	$f_i x_i$	\bar{x}	$(x_i - \bar{x})^2$	$f(x_i - \bar{x})^2$
Range	8					
60 - 65	26	62.5	375	70.5	64	384
65 - 70	39	67.5	607.5	70.5	9	81
70 - 75	3	72.5	217.5	70.5	4	12
75 - 80	3	77.5	232.5	70.5	49	147
80 - 85	1	82.5	330	70.5	144	576
Total	25		1762.5			1200

$$\text{mean, } \bar{x} = \frac{1762.5}{25} = 70.5$$

$$\therefore \text{Standard deviation} = \sqrt{\frac{\sum f(x_i - \bar{x})^2}{n-1}}$$

$$= \sqrt{50} = 7.1 \text{ (Ans)}$$

Ans. to Q No - 7 (a)



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b) For street 1:

$$\text{Mean} = \frac{32.5 \times 4 + 66 \times 11 + 68 \times 18 + 70 \times 23 + 72 \times 16 + 74 \times 9 + 76 \times 5 + 78 \times 4 + 80 \times 2}{92}$$

$$= 69.13 \text{ (Ans)}$$

$$\text{Median} = \frac{L_o + \frac{n}{2} - F_{mc}}{f_{mc}} \times w$$

Here, Middle class = $\frac{n}{2} = 46^{\text{th}}$ observation,

$(69-71) = (69-71)$ class range

$$\therefore L_o = 69, n = 92, f_{mc} = 33, f_{me} = 23, w = 2$$

$$\therefore \text{Median} = 69 + \left(\frac{46 - 33}{23} \right) \times 2$$

$$= 70.13 \text{ (Ans)}$$

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Here, modal class = (69-71)

$$f_0 = 23, f_1 = 18, f_2 = 16, w = 2, l_0 = 69$$

$$\begin{aligned}\text{Mode} &= l_0 + \frac{f_0 - f_1}{f_0 - f_1 + f_1 - f_2} \times w \\ &= 69 + \frac{23 - 18}{23 - 18 + 18 - 16} \times 2 \\ &= 69.83 \text{ (Ans)}\end{aligned}$$

For street 2:

Here middle class = (71-73)

Therefore, $L_0 = 71, n = 92, f_{mc} = 24, f_{m-1} = 27, w = 2$

$$\begin{aligned}\text{Median} &= L_0 + \frac{\frac{n}{2} - f_{mc}}{f_{m-1}} \times w \\ &= 71 + \frac{46 - 24}{27} \times 2 \\ &\Rightarrow 72.62\end{aligned}$$

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H

$$\text{Mean} = \frac{32 \times 2 + 66 \times 3 + 68 \times 7 + 70 \times 12 + 72 \times 27 + 74 \times 16}{36 + 28} = 72$$

$$= 72.29$$

Here, modal class = (71-73)

$$\therefore L_0 = 71, f_0 = 27, f_1 = 12, f_2 = 16, w = 2$$

$$\therefore \text{Mode} = 71 + \frac{27 - 12}{27 - 12 + 27 - 16} \times 2$$

$$= 72.15 \quad (\text{Ans})$$

Am. to No - 8

a)

Stem	Leaf
0	5, 6, 6, 9
2	1, 3, 5
3	4
4	9
5	0, 5, 5, 6
6	0, 1, 1, 3, 5, 6, 8
7	8, 8,
8	3, 3, 5, 6, 7, 7, 8, 9, 9
9	2, 3, 5
10	3
11	2, 2, 4
12	1, 6, 7, 7
13	2, 4
14	0, 2, 6, 6, 7, 9

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b) total interval = 4129

$$\therefore \text{Mean} = \frac{4129}{50} = 82.58$$

$$\therefore \text{Median} = \frac{25^{\text{th}} + 26^{\text{th}}}{2}$$

$$= \frac{85 + 86}{2} = 85.5$$

$\therefore \text{Mode} = 06, 55, 61, 78, 83, 87, 89, 112, 127,$
146

Ans. to Q No - 9

1st 50 km, time needed = $50/30 = 1.67$ hours

2nd 50 " " " = $50/40 = 1.25$ hours

3rd 50 " " " = $50/20 = 2.50$ hours

$$\therefore \text{Average speed} = \frac{50 + 50 + 50}{1.67 + 1.25 + 2.50}$$

$$= 27.68 \text{ km/hours}$$

(Ans)

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13

Ans & Ques No - 10

Base Price = 250 000

$$\therefore \text{After 1 year} = 250000 \times 1.5 = 375000$$

$$\therefore \text{in 2 years} = 375000 \times 1.25 = 468750$$

$$\therefore \text{in 5 years} = 468750 \times 1.25 \times 1.25 \times 1.25 \\ = 915527.34$$

(Ans)