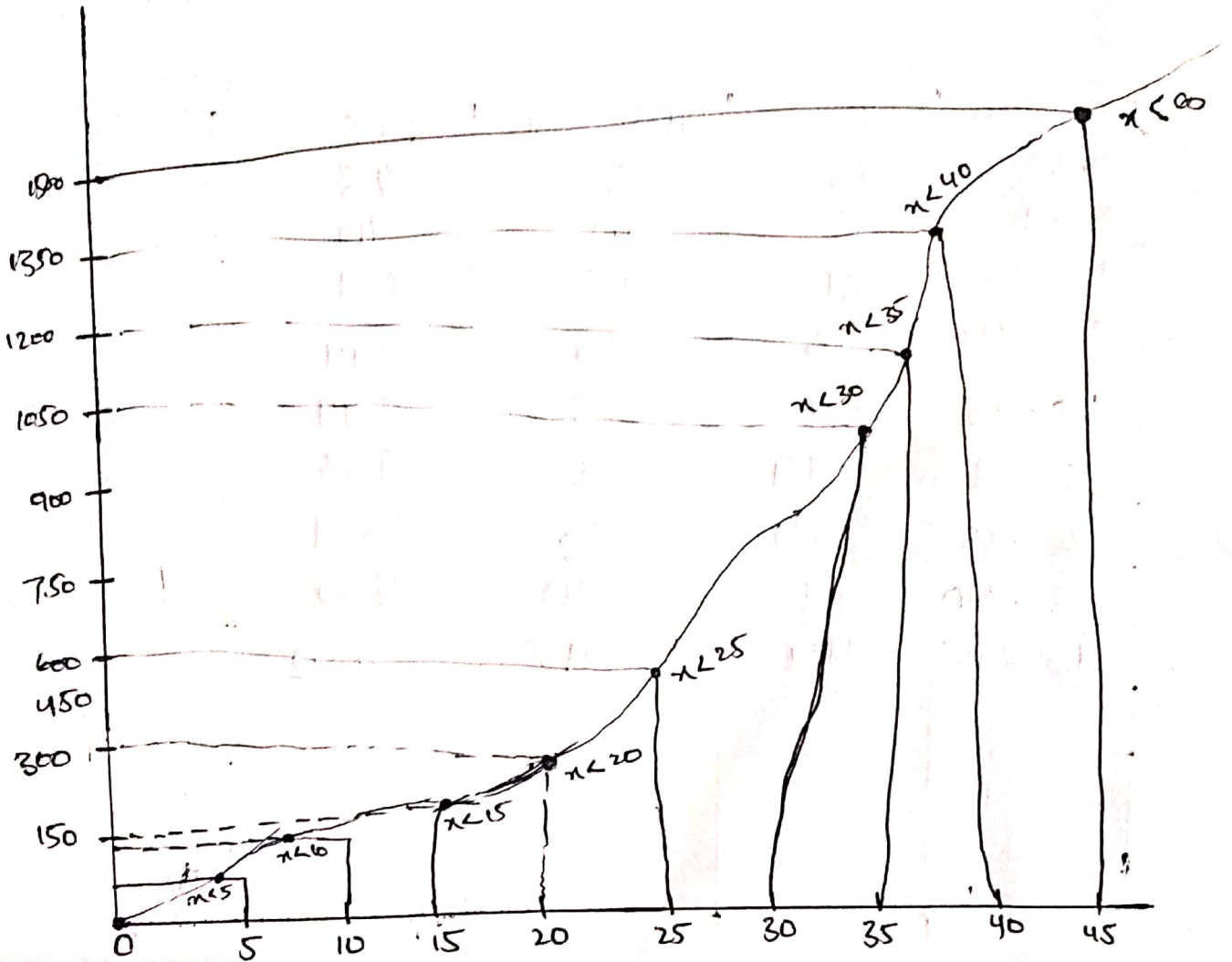


Question # 1
Part (a)

time taken	F	Upper Percent	C.F
0-5	25	5	25
5-10	45	10	70
10-15	81	15	151
15-20	143	20	294
20-25	280	25	574
25-30	349	30	953
30-35	374	35	1379
35-40	395	40	1672
40-45	400	45	2092

cumulative frequency distance.

~~XXXXXXXXXX~~



Time taken

Cumulative frequency curve.

Question # 1

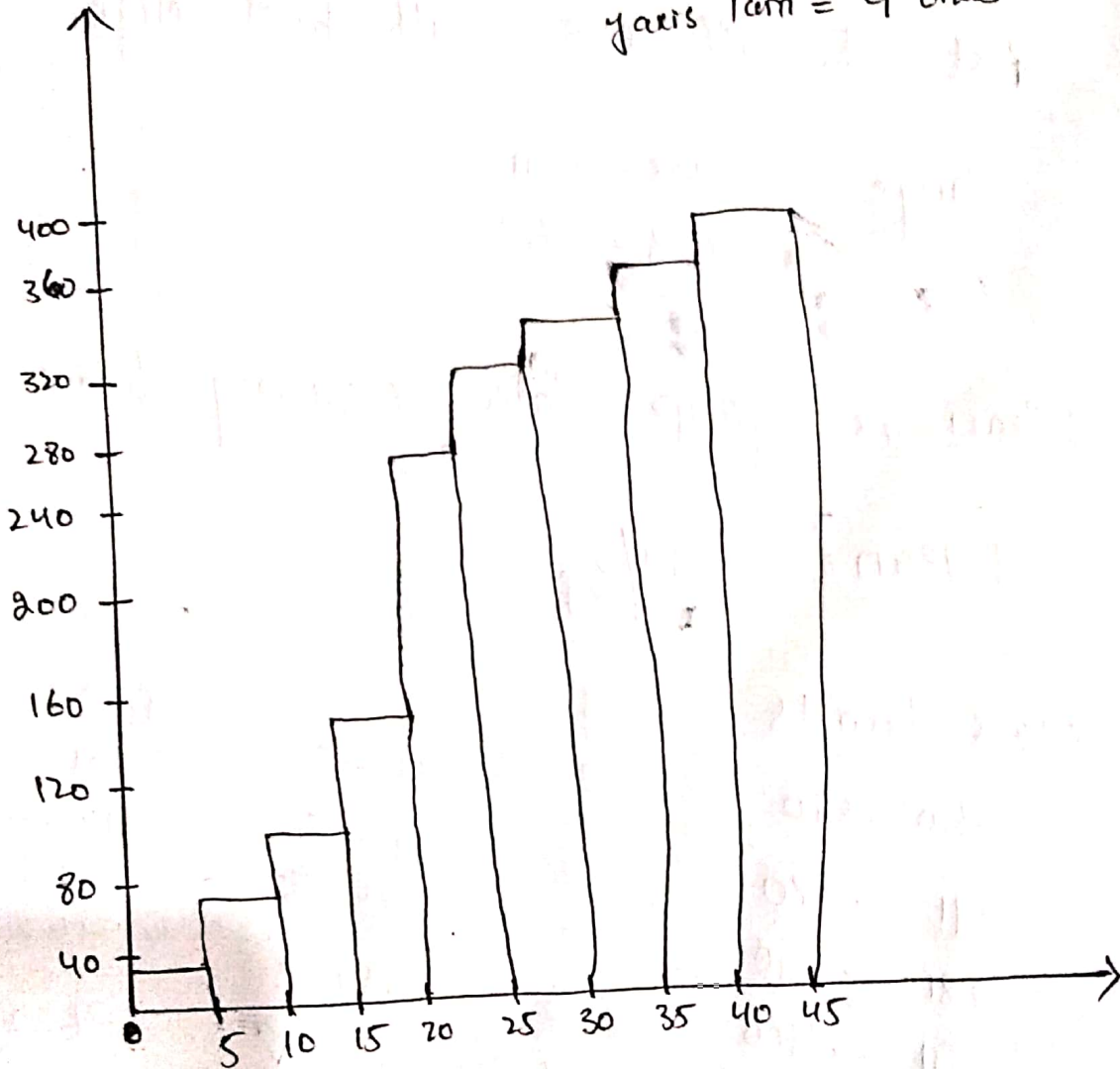
Part (b)

3

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Answer:- Histogram.

Scale = x axis 1cm = 5 units
y axis 1cm = 4 units



Histogram:

Question # 2.

Solutions:-

Mean=?, Mode=?, Quartiles=?

first of all we will find Range

$$\begin{aligned} \text{Range} &= \text{max} - \text{min} \\ &= 428 - 363 \\ &= 65 \end{aligned}$$

Mean for group data, frequency distance.

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

class limits	f	x	$\sum f(x)$
360-370	2	365-5	731
371-380	3	375-5	1126-5
381-390	6	385-5	2313
391-400	8	395-5	3163
401-410	4	405-5	1622
411-420	3	415-5	1246-5
421-430	3	425-5	1276-5
431-440	1	435-5	4355
Total	30		$\sum f(x) = 11915$

(i) Mean = ?

$$\begin{aligned} \text{Mean} &= \frac{\sum f(x)}{\sum f} \\ &= \frac{11915}{30} \end{aligned}$$

$$\boxed{\text{Mean} = 397.2}$$

$$\text{Mode} = lb_{m} + \left[\frac{D_1}{D_1 + D_2} \right] i$$

(ii) Mode =

$$lb = 391 - 0.5 = 390.5$$

$$i = 381 - 371 = 10$$

$$D_1 = 8 - 6 = 2$$

$$D_2 = 8 - 4 = 4$$

$$\text{Mode} = 390.5 + \left[\frac{2}{2+4} \right] 10$$

$$= 390.5 + \left(\frac{1}{3} \right) 10$$

$$= 390.5 + 3.33$$

$$\boxed{\text{Mode} = 393.83}$$

(iii) Quartile :-

Class limits	f	Midpoint	CF
361 - 370	2	365.5	2
371 - 380	3	375.5	5
381 - 390	6	385.5	11
391 - 400	8	395.5	19
401 - 410	4	405.5	23
411 - 420	3	415.5	26
421 - 430	3	425.5	29
431 - 440	1	435.5	30

1st lower Quartile

$$Q_1 = L_1 + \left(\frac{n/4 - C_1}{f_1} \right) w_1$$

where, $L_1 \rightarrow$ lower class boundary

$C_1 \rightarrow$ cumulative frequency of the before lower class

$f_1 \rightarrow$ frequency of lower class.

$n \rightarrow$ total no. of values.

$w_1 \rightarrow$ class width.

$$Q_1 = L_1 + \left(\frac{n/4 - C_1}{f_1} \right) w_1$$

$$P_1 = 1/4 (n+1)^{th} \Rightarrow 3/4 = 7.75^{th}$$

$$Q_1 = 38.5 + \left(\frac{30/4 - 5}{6} \right) 10 = 405.5$$

$$Q_2 = \text{Median} = L_2 + \left(\frac{n/2 - C_2}{f_2} \right) w_2$$

$$P_2 = \frac{1}{4} (31)^{\text{th}}$$

$$P_2 = 31/4 = 7.75$$

$$P_2 = 16^{\text{th}}$$

$$Q_2 = \text{Median} = L_2 + \left(\frac{n/2 - C_2}{f_2} \right) w_2$$

$$Q_2 = 390.5 + 5$$

$$Q_2 = 395.5$$

$$Q_3 = L_3 + \left(\frac{28/4 - C_3}{f_3} \right) w_3$$

$$P_3 = \frac{3}{4} (n+1)^{\text{th}}$$

$$= \frac{3}{4} (31)^{\text{th}} = 23.25$$

$$P_3 = (23)^{\text{th}}$$

$$Q_3 = 400.5 + \left(\frac{3(30)/4 - 19}{4} \right) 10$$

$$Q_3 = 400.5 + 8.25$$

$$Q_3 = 409.25$$

Question # 3.

Answer:-

Solution :-

Given data first:

\Rightarrow 3, 6, 2, 1, 7, 5.

$$\text{Mean} = \frac{3+6+2+1+7+5}{6}$$

$$= \frac{24}{6} =$$

$$\boxed{\text{Mean} = 4}$$

Now

x	x^2
3	9
6	36
2	4
1	1
7	49
5	25
$\Sigma = 24$	$\Sigma = 124$

Standard Deviation:- $\sqrt{\frac{\Sigma x^2}{N} - \left(\frac{\Sigma x}{N}\right)^2}$

$$\text{So, S.D} = \sqrt{\frac{124}{6} - \frac{576}{36}}$$

$$= \sqrt{\frac{168}{36}}$$

$$\boxed{\text{S.D} = 2.2}$$

Given data second:-

Now, 11, 17, 9, 7, 19, 15

Find the Mean = ?

$$\text{Mean} = \frac{11 + 17 + 9 + 7 + 19 + 15}{6}$$

$$\text{Mean} = 78/6$$

$$\boxed{\text{Mean} = 13} \text{ Ans.}$$

Formula:- Standard deviation = $\sqrt{\frac{\sum x^2}{N} - \frac{(\sum x)^2}{N}}$

x	x^2
11	121
17	289
9	81
7	49
19	361
15	225
$\Sigma = 78$	$\Sigma = 1126$

$$\text{Now, S.D} = \sqrt{\frac{\sum x^2}{N} - \frac{(\sum x)^2}{N}}$$

$$= \sqrt{\frac{1126}{6} - \frac{6084}{36}}$$

$$= \sqrt{\frac{672}{36}}$$

$$\boxed{\text{S.D} = 4.3}$$

Question # 4.

Class	f	X
64-84	15	74
85-104	18	74.5
105-124	27	114.5
125-144	10	134.5
145-164	6	154.5
165-184	5	174.5
185-204	13	194.5
	<u>94</u>	

$$\text{Range} = UB(HC) - LB(LC)$$

$$= 204.5 - 68.5$$

$\text{Range} = 141$

$$\bar{x} = \frac{\sum f(x)}{\sum f}$$

$$\bar{x} = 11575.3 / 94$$

$$\bar{x}^2 = 123$$

9.

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$$\text{Variance} = \frac{\sum f(x-3)^2}{\sum f - 1}$$

$$\text{Variance} = \frac{139939 \cdot 25}{94 - 1}$$

$$\text{Variance} = \frac{139459 \cdot 25}{93}$$

$$\boxed{\text{Variance} = 1499.5}$$

As we know that.

$$S.D = \sqrt{\text{Variance}}$$

$$S.D = \sqrt{1499.5}$$

$$\boxed{S.D = 39}$$

Question #5

Part (A)

Answer:-

Comment:- No it is not obviously that all the people have height 5 feet can easily cross it. if he did not know swimming and river is not deep uniformly it is 2 feet at some point while 7 feet on other points, so, he will cross it.

Part (B)

Answer:- Comment:-

No it does not mean every student is hopeless. Both students whose marks have than 30. Some have 30 marks & some students have greater than 30 marks. There can be few students whose marks may be 60 or more.

Part (C)

Answer:- Comment:-

No it is not true that all the household servants must be paid. Average pay does not mean everyone get paid same. The king income will be much more than servants.