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**ID :[15440](#)**

**Paper : Basic Statistics**

**Submitted to : Sir Raza Ahmed**

**BBA 3rd Semester**

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# Basic Statistics

27/06/2020

ID No: 15440

Rafi-ullah

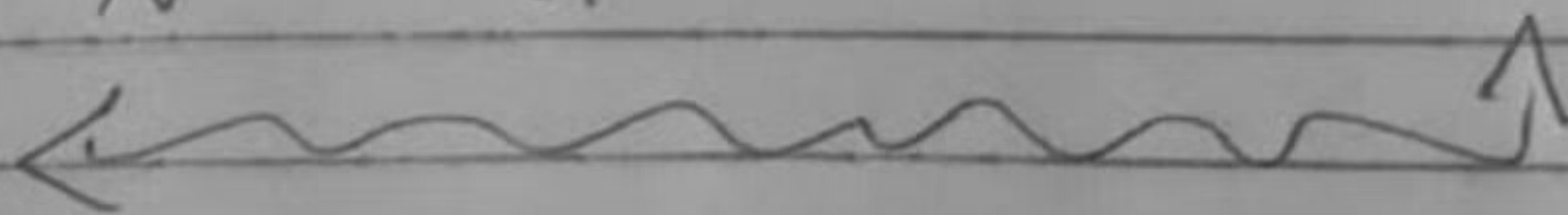
Answer of Question No: 1  
Part (A)

F · X	F · log(X)	F/X
4	0	4
26	3.91	6.5
27	2.29	3
16	2.40	1
5	0.64	0.2
78	11.29	14.7

$$G.m = \text{Antilog} \left( \frac{\sum F \cdot \log(X)}{N} \right) = \text{Antilog} \left( \frac{11.29}{31} \right)$$

$$H.m = \frac{\sum F}{\frac{\sum F}{X}} = \frac{31}{14.7} = 2.10$$

$$A.m = \frac{\sum F \cdot X}{N} = \frac{78}{31} = 2.51$$





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Q1 Part (B)

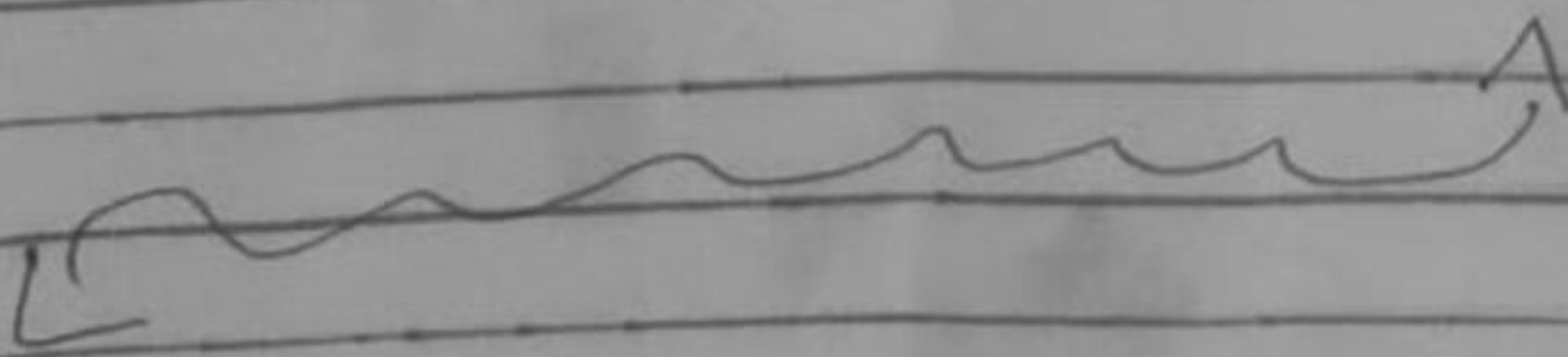
class boundaries	Mid Point	F	FX	$F \cdot \log(x)$	$F/x$	Cum-Freq
-0.5-9.5	4.5	2	9	1.30	0.44	2
9.5-19.5	14.5	31	449.5	36.00	2.13	33
19.5-29.5	24.5	73	1788.5	101.40	2.97	106
29.5-39.5	34.5	85	2932.5	130.71	2.46	191
39.5-49.5	44.5	28	1246	46.15	0.62	219
		219	6425.5	315.56	8.62	

$$G.M = \text{Antilog} \left( \frac{\sum F \cdot \log(x)}{N} \right) = \text{Antilog} \left( \frac{315.56}{219} \right)$$

$$\text{Antilog}(1.44) = 27.57$$

$$H.M = \frac{\sum F}{\frac{\sum F}{x}} = \frac{219}{8.62} = 25.40$$

$$A.M = \frac{\sum F \cdot X}{N} = \frac{6425.5}{219} = 29.34$$



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Answer of Q No: 2  
Part A

No. of child Per family	No. of family	Cum. Freq
1	4	4
2	18	22
3	9	31
4	4	35
5	1	36
	<u>36</u>	

$$\text{Median} = \frac{2+3}{2} = \frac{5}{2} = 2.5 \quad N = \frac{36}{2} = 18$$

$$\text{Mode} = 2$$





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Q: No: 2 Part (B)

$$\text{Median} = L + \left( \frac{\frac{N}{2} \cdot C.F}{F} \right) \cdot X_i$$

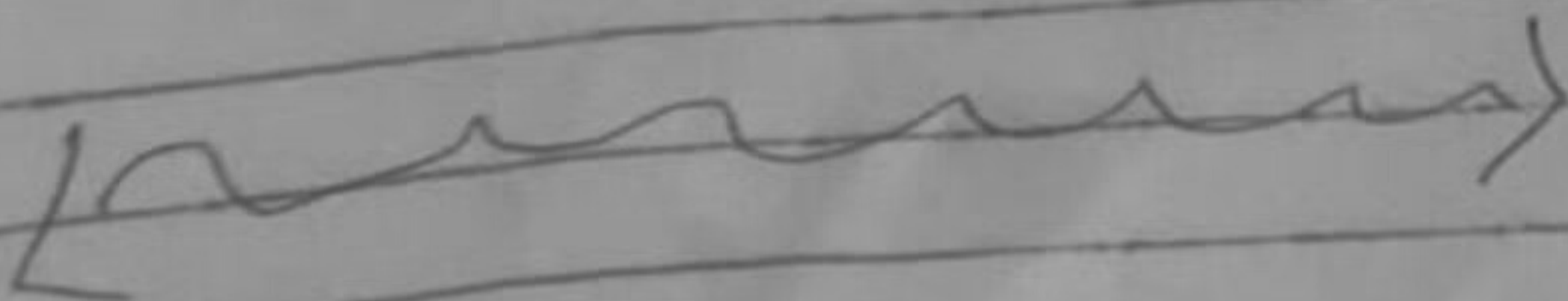
$$29.5 + \left( \frac{109.5 - 106}{85} \right) \cdot 10$$

$$29.5 + \frac{3.5}{85} \times 10 = \boxed{29.91}$$

$$\text{Mode} = L + \left( \frac{F_1 - F_0}{2F_1 - F_0 - F_2} \right) \cdot X_i$$

$$= 29.5 + \left( \frac{85 - 73}{170 - 73 - 28} \right) \cdot 10$$

$$= 29.5 + 1.73 = 31.23$$



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Answer of Q No 3

Part (A)

e.g 1, 2, 3, 4, 5

$$Q_1 = \text{Size of } \left( \frac{n+1}{4} \right)^{\text{th item}}$$

$$= \left( \frac{5+1}{4} \right)^{\text{th item}} = (2.25) \equiv 2^{\text{nd}}$$

$$Q_1 = 2$$

$$Q_2 = \text{Size of } \left( \frac{2n+1}{4} \right)^{\text{th item}}$$

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

$$Q_2 = 4$$

$$Q_3 = \text{Size of } \left( \frac{3n+1}{4} \right)^{\text{th item}}$$

$$= \left( \frac{15+1}{4} \right)$$

$$Q_3 = 4.7 = 5 \rightarrow Q_3 = 5$$



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Semi-Inter-quartile range =

$$\frac{Q_3 - Q_1}{2} = \frac{5 - 2}{2} = \frac{3}{2} = 1.5$$

Semi Quartik range

$$Q_3 - Q_1 = 5 - 2 = 3$$

Q: 3 Part (B)

No. of children per family	No. of families	$X - \bar{X}$	$(X - \bar{X})^2$	$F \cdot X$	$F(X - \bar{X})^2$
1	4	77	5929	4	23716
2	13	76	5776	26	75088
3	9	75	5625	27	50625
4	4	74	5476	16	21904
5	1	73	5329	5	5329
				78	176662

Variance =  $\frac{\sum F(X - \bar{X})^2}{\sum F - 1} = \frac{176662}{30} = 5888.7$

S.D =  $\sqrt{5888.7} = 76.73$

C.V =  $\frac{S.D \times 100}{\bar{X}} = \frac{76.73}{78} = 98.37$



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Answer of Q NO: 4

- ① Range
- ② Quartile Range
- ③ Semi inter quartile Range
- ④ Variance
- ⑤ Standard Deviation
- ⑥ Coefficient of Variation

## Range

The range of a set of data is the difference b/w the largest and smallest values is called Range.

1 1 1 1 1 1 1 1  
3 4 6 7 8 9

← Range →

$$9 - 3 = 6$$

## Quartile Range

In descriptive statistics, the interquartile range, also called the mid-spread, or a middle 50% or H-spread is a measure of statistical dispersion, being equal to the difference b/w 75<sup>th</sup> and 25<sup>th</sup> percentiles or b/w upper and



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lower quartile,  $IQR = Q_3 - Q_1$ .Variance:

In probability theory and statistics, Variance is the expectation of the squared deviation of a random variable from its mean. Informally, it measures how far a set of numbers are spread out from their average value.

