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①

Q # 03:- Define the following

(a) Random Statistics:-

In statistics a random variable is an assignment of numerical value to each possible outcome of event space. These association facilitates the identification and the calculation of probabilities of each event

(b) Inferential Statistics:-

Inferential Statistics is a branch of statistics through which we collect the data analysis, summarize the data, interpret the data and tabulate the data to get precise result in non-numerical form.

(c) Descriptive Statistics:-

The collection of data analysis of data, summarization of data, interpretation of data, tabulation of data at last we get a precise result in numerical form is called descriptive ~~data~~ Statistics OR

Descriptive Statistics is concerned with the summarization and describing a body of data

(d) Sources of Primary Data:- We have the following sources

- 1) Direct personal investigation
- 2) Indirect investigation
- 3) Interview method
- 4) Collection through Enumerators
- 5) Questioner method
- 6) Collection through local sources

(2)

### (E) Nominal Scale:-

It can be define as the classification of the observation into mutually exclusive qualitative classes is said to be nominal scale.

- E.g# i) Students are classified as male & female. we may use number 1 & 2
- ii) Rainfall may be classified as heavy, moderate and light we may use number 1, 2 & 3
- The numbers when they are used, only identify the categories. In this scale no particular order is used.

(3)

Q#02:-

Sol:-

	Classes	Class Boundaries	Frequency (F)	Cumulative Frequency (cf)
ite	2-4	1-5	3	3
	6-8	5-9	13	16
	10-12	9-13	6	22
	14-16	13-17	10	32
	18-20	17-21	5	37
	22-24	21-25	3	40
	26-28	25-29	5	45
	30-32	29-33	3	48
	34-36	33-37	2	50
			$\Sigma F = 50$	

Quartiles:-

$$Q_1 = n/4 \Rightarrow 50/4 = 12.5$$

12.5 lies in 5-9 class boundary

So

$$Q_1 = l + \frac{h}{f} \left( \frac{n}{4} - c \right)$$

$$= 5 + \frac{4}{13} \left( \frac{50}{4} - 3 \right)$$

$$= 5 + 0.30 (12.5 - 3)$$

$$= 5 + 0.30 (9.5)$$

$$\boxed{Q_1 = 7.85}$$

4

$$Q_2 = \frac{2n}{4} \Rightarrow \frac{2 \times 50}{4} = 25$$

25 lies in 13-17 class boundary  
So

$$\begin{aligned} Q_2 &= l + \frac{h}{f} \left( \frac{2n}{4} - c \right) \\ &= 13 + \frac{4}{10} \left( \frac{2 \times 50}{4} - 22 \right) \\ &= 13 + \frac{4}{10} (25 - 22) \\ &= 13 + \frac{4}{10} (3) \\ &= 13 + 1.2 \end{aligned}$$

$$Q_2 = 14.2$$

$$Q_3 = \frac{3n}{4} = \frac{3 \times 50}{4} \Rightarrow 37.5$$

37.5 lies in 21-25 class boundary  
So

$$\begin{aligned} Q_3 &= l + \frac{h}{f} \left( \frac{3n}{4} - c \right) \\ &= 21 + \frac{4}{3} \left( \frac{3 \times 50}{4} - 37 \right) \\ &= 21 + \frac{4}{3} (37.5 - 37) \end{aligned}$$

$$= 21 + \frac{4}{3} (0.5)$$

$$= 21 + 0.67$$

$$Q_3 = 21.67$$

(5)

Deciles:-

$$D_1 = \frac{n}{10} = \frac{50}{10} = 4$$

4 lies in 5-9 class boundary

Hence

$$\begin{aligned} D_1 &= l + \frac{h}{f} \left( \frac{n}{10} - c \right) \\ &= 5 + \frac{4}{13} \left( \frac{50}{10} - 3 \right) \\ &= 5 + \frac{4}{13} (5 - 3) \\ &= 5 + \frac{4}{13} (2) \\ &= 5 + 0.61 \end{aligned}$$

$$\boxed{D_1 = 5.61}$$

$$D_2 = \frac{2n}{10} \Rightarrow \frac{2 \times 50}{10} = 10$$

10 lies in 5-9

Hence

$$\begin{aligned} D_2 &= l + \frac{h}{f} \left( \frac{2n}{10} - c \right) \\ D_2 &= 5 + \frac{4}{13} \left( \frac{2 \times 50}{10} - 3 \right) \\ D_2 &= 5 + \frac{4}{13} (10 - 3) \\ D_2 &= 5 + \frac{4}{13} (7) \end{aligned}$$

$$D_2 = 5 + 2.15$$

$$\boxed{D_2 = 7.15}$$

(6)

$$D_3 = \frac{3n}{10} = \frac{3 \times 50}{10} = 15$$

15 lies in 5-9 class boundary

$$\text{Hence } D_3 = l + \frac{h}{f} \left( \frac{3n}{10} - c \right)$$

$$D_3 = 5 + \frac{4}{13} \left( \frac{3 \times 50}{10} - 3 \right)$$

$$D_3 = 5 + \frac{4}{13} (15 - 3)$$

$$D_3 = 5 + 0.307(12)$$

$$D_3 = 5 + 3.69$$

$$\boxed{D_3 = 8.69}$$

$$D_4 = \frac{4n}{10} = \frac{4 \times 50}{10} \Rightarrow 20$$

20 lies in 9-13 class boundary

$$\text{Hence } D_4 = l + \frac{h}{f} \left( \frac{4n}{10} - c \right)$$

$$D_4 = 9 + \frac{4}{6} (20 - 16)$$

$$D_4 = 9 + \frac{4}{6} (4)$$

$$D_4 = 9 + 2.67$$

$$\boxed{D_4 = 11.67}$$

$$D_5 = \frac{5n}{10} \Rightarrow \frac{5 \times 50}{10} \Rightarrow 25$$

25 lies in 13-17 class boundary

$$\text{Hence } D_5 = l + \frac{h}{f} \left( \frac{5n}{10} - c \right)$$

(7)

$$\begin{aligned} D_5 &= 13 + \frac{4}{10} \left( \frac{5 \times 50}{10} - 22 \right) \\ &= 13 + \frac{4}{10} (25 - 22) \\ &= 13 + \frac{4}{10} (3) \end{aligned}$$

$$\boxed{D_5 = 14.2}$$

$$D_6 = \frac{6n}{10} \Rightarrow \frac{6 \times 50}{10} = 30$$

30 lies in 13-17 class boundary

$$\text{Hence } D_6 = l + h/7 \left( \frac{6n}{10} - c \right)$$

$$= 13 + \frac{4}{10} \left( \frac{6 \times 50}{10} - 22 \right)$$

$$= 13 + \frac{4}{10} (30 - 22)$$

$$= 13 + \frac{4}{10} (8)$$

$$= 13 + 3.2$$

$$\boxed{D_6 = 16.2}$$

$$D_7 = \frac{7n}{10} \Rightarrow \frac{7 \times 50}{10} \Rightarrow 35$$

35 lies in 17-21 class boundary

Hence

$$D_7 = l + h/7 \left( \frac{7n}{10} - c \right)$$

$$D_7 = 17 + \frac{4}{5} \left( \frac{7 \times 50}{10} - 32 \right)$$

$$D_7 = 17 + \frac{4}{5} (3)$$

$$= 17 + 2.4$$

$\Rightarrow$

$$\boxed{D_7 = 19.4}$$



(8)

$$D_8 = \frac{8n}{10} \Rightarrow \frac{8 \times 50}{10} \Rightarrow 40$$

40 lies in 21-25 Class boundary

Hence

$$\begin{aligned} D_8 &= l + \frac{h}{7} \left( \frac{8n}{10} - c \right) \\ &= 21 + \frac{4}{3} \left( \frac{8 \times 50}{10} - 37 \right) \\ &= 21 + \frac{4}{3} (40 - 37) \\ &= 21 + \frac{4}{3} (3) \\ &= 21 + 4 \end{aligned}$$

$$D_8 = 25$$

$$D_9 = \frac{9n}{10} = \frac{9 \times 50}{10} \Rightarrow \frac{450}{10} = 45$$

45 lies in 25-29 Class boundary

Hence

$$\begin{aligned} D_9 &= l + \frac{h}{7} \left( \frac{9n}{10} - c \right) \\ D_9 &= 25 + \frac{4}{5} \left( \frac{9 \times 50}{10} - 40 \right) \end{aligned}$$

$$D_9 = 25 + \frac{4}{5} (45 - 40)$$

$$D_9 = 25 + 4$$

$$D_9 = 29$$

(9)

Q# 01:-

Sol:- Grouped frequency Distribution

Largest Value = 10

Smallest Value = 0

$$\text{Range} = 10 - 0 = 10$$

We decided to take 5 classes of equal size 2

$$h = \frac{10}{5} = 2 \text{ Say } 2.1$$

$$h = 2.1$$

Class (weight)	Class Boundary	Mid Point	Tally	Frequency	Cummulative Frequency
0-2	-0.05-2.05	1		13	13
2.1-4.1	2.05-4.15	3.1		21	34
4.2-6.2	4.15-6.25	5.2		9	43
6.3-8.3	6.25-8.33	8.3		5	48
8.4-10.4	8.35-10.45	9.4		2	50
				$\Sigma F = 50$	

UN-GROUPED FREQUENCY

No: of Children	Tally	Frequency	Cummulative Frequency
0		1	1
1		4	5
2		8	13
3		14	27
4		7	34
5		5	39
6		4	43
7		3	46
8		2	48
9		1	49
10		1	50

(10)

(b) Grouped frequency distribution

Mode:

$$M = l + \frac{f_m - f_1}{(f_m - f_1) + (f_m - f_2)} \times h \quad \text{--- (1)}$$

$$l = 2.05$$

$$f_m = 21$$

$$f_1 = 13$$

$$f_2 = 9$$

$$h = 2.1$$

$$M = 2.05 + \frac{(21 - 13)}{(21 - 13) + (21 - 9)} \times 2.1$$

$$M = 2.89 \approx 3$$

$$\boxed{M = 3}$$

Median:

First we check  $\frac{n}{2}$

$$n/2 = \frac{50}{2} = 25$$

So;

$$l = 2.05$$

$$h = 2.1$$

$$f = 21$$

$$c = 13$$

$$\begin{aligned} \text{Median} &= l + \frac{h}{f} (n/2 - c) \\ &= 2.05 + \frac{2.1}{21} \left( \frac{50}{2} - 13 \right) \\ &= 3.25 \approx 3 \end{aligned}$$

$$\boxed{\text{Median} = 3}$$

# Un grouped Frequency Distribution

Mode:

In ungrouped data ~~high~~ highest frequency is 14 So the No. of Childrens in front of 14 is 3

Thus

$$\text{Mode} = 3$$

Median

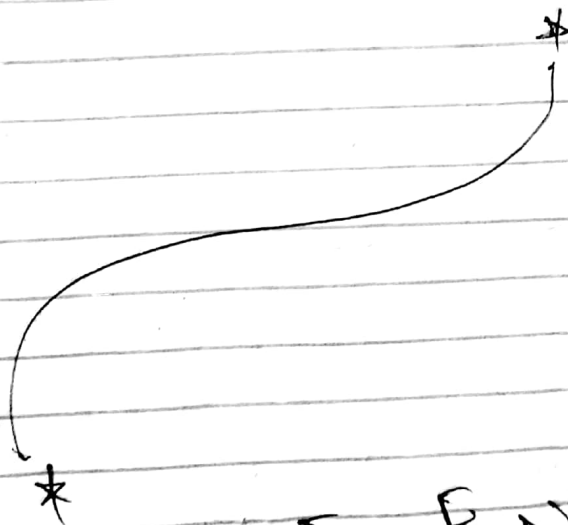
our data is even as it is 50

So

$$\text{Median} = n/2$$

$$= 50/2$$

$$= 25$$



The END.