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Q.No(1)

The following figures gives the number of children both to 50 women.

Ans. Solution: -

Ans. -

Take I

# of children	# of women	Tally	C.f
(x)	(f)	Tally	C.f
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
Total	50		

Grouped - freq = dist (Table II)

Classes	(f)	C.f
0 - 1	5	$f_0$ 5
2 - 3	22	$f_m$ 27
4 - 5	17	$f_1$ 39
6 - 7	7	46
8 - 9	3	49
10 - 11	1	50
Total	50	

(ii) Mode from ungrouped freq, dist

In table (I)

$$f_m = 14$$

$$\text{mode} = 2$$

Similarly mode from grouped freq, dist

In table (II)

$$f_m = 22$$

$\Rightarrow$  our modal class is (2-3)

for which class boundary are (1.5 - 3.5)

$$\text{Hence mode} = L + \frac{f_m - f_o}{2f_m - f_o - f_b} \times h$$

$$= 1.5 + \frac{22 - 5}{2(22) - 12 - 5} \times 2$$

$$= 1.5 + \frac{17}{27} \times 2$$

$$\boxed{\text{mode} = 2.76}$$

Now median from ungrouped data

as  $n = 50$  (Even)

$$\text{Median} = \text{size of } \frac{n}{2} \text{th item}$$

$$= \text{size of } \frac{50}{2} \text{th item}$$

$$= \text{size of } 25 \text{th}$$

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

Now median from grouped freq = dist

$n = 50$  (Even)

$$\Rightarrow \text{Median} = \text{size of } \left(\frac{n}{2}\right) \text{th}$$

$$= \text{size of } 25 \text{th}$$

$\Rightarrow$  Median lies in class (2-3)  
C-B for this group are (1.5-3.5)

$$\begin{aligned}\Rightarrow \text{Median} &= L + \frac{h}{f} (M - cf) \\ &= 1.5 + \frac{2}{22} (25 - 5)\end{aligned}$$

$$\begin{aligned}&= 1.5 + \frac{1}{11} (20) \\ &= 1.5 + 1.82\end{aligned}$$

$$\boxed{\text{Median} = 3.32}$$

## Q2:- Solution:-

Classes	f	C-B	c.f
2-4	3	1-5	3
6-8	13	5-9	16
10-12	6	9-13	22
<del>12-14</del> 14-16	10	13-17	32
18-20	5	17-21	37
22-24	3	21-25	40
26-28	5	25-29	45
30-32	3	29-33	48
34-36	2	33-37	50
Total	50	←	—

$Q_{\text{un}} + \text{tile} = ?$  As  $n = \sum f = 50$  (even)

$$Q_1 = \text{size } \frac{1}{4} \text{th}$$

$$Q_1 = \text{size } \frac{50}{4} \text{th}$$

$$Q_1 = \text{size } (12.5 \text{th})$$

$$Q_1 = \text{lies in } (5-9)$$

$$Q_1 = l + \frac{h}{f} \cdot (Q_1 - c.f)$$

$$Q_1 = 5 + \frac{4}{13} \cdot (12.5 - 3)$$

$$Q_1 = 5 + 2.92$$

$$Q_1 = 7.92$$

$$Q_2 = \text{size of } \frac{2(n)}{2} \text{th}$$

$$Q_2 = \text{size of } \frac{50}{2} \text{th}$$

$$Q_2 = \text{lies in } (13-17)$$

$$Q_2 = \text{median} = l + \frac{1}{f} (Q_2 - cf)$$

$$= 13 + \frac{4}{10} (25 - 22)$$

$$= 13 + 1.2$$

$$Q_2 = 14.2$$

Now

$$Q_3 = \text{size of } 3(n) \text{th}$$

$$Q_3 = \text{size of } 3(50) \text{th}$$

$$Q_3 = \text{size of } 37.5 \text{th}$$

$$Q_3 = \text{lies in } (21-25)$$

$$Q_3 = l + \frac{1}{f} (Q_3 - cf)$$

$$Q_3 = 21 + \frac{4}{3} (37.5 - 37)$$

$$Q_3 = 21 + 0.67$$

$$Q_3 = 21.67$$

Deciles = 1

1<sup>st</sup> Deciles =  $D_1$  = size of  $\frac{1}{10}$  th. $D_1$  = size of  $\frac{50}{10}$  th. $D_1$  = size of 5th. $\Rightarrow D_1$  = lies in (5-9) $\Rightarrow D_1 = l + \frac{h}{f} (D_1 - cf)$ 

$$D_1 = 5 + \frac{4}{13} (5 - 3)$$

$$D_1 = 5 + \frac{4}{13} (2)$$

$$D_1 = 7.15$$

Now  $D_5$  = median =  $Q_2 = 14.2$ Similarly  $D_9$  = upper deciles $D_9$  = size of  $\frac{9}{10}$  (h) th. $D_9$  = size of  $\frac{9(50)}{10}$  th. $D_9$  = size of  $\frac{450}{10}$  th. $D_9$  = size of 45th. $\Rightarrow D_9$  lies in (29-3)

$$D_9 = \frac{L + h}{f} (D_9 - cf)$$

$$D_9 = \frac{29 + 4}{3} (45 - 45)$$

$$D_9 = 29 + 0$$

$D_9 = 29$



Q3-

Define the following

(a) Random Statistic :-

The field of mathematics, Probability, & statistics use formal definition of randomness. In statistics, a random variable is an assignment of a numerical value to each possible outcome of an event space.

(b) Inferential Statistics :-

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

(c) Descriptive Statistics :-

Descriptive statistics is concerned with the summarization the describing a body of data.

(d) SOURCE of PRIMARY DATA :-

- (i) Direct personal investigation.
- (ii) Indirect investigation.
- (iii) Interview method.
- (iv) Collection through Enumerators.
- (v) Questioner method.
- (vi) Collection through local sources.
- (vii) Computer interview method.

## (e) Nominal Scales →

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

e.g.

(i) Students are classified as male & female. We may use 1 & 2.

(ii) Rainfall may be classified as heavy, moderate & light. We may use number 1, 2 & 3.

The number when they are used, only identify the ~~with~~ categories. In this scale no particular order is used.