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Section

"C"

Department

BS - civil.

Subject

Probability &
Statistics.

Submitted TO

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Question NO # 01

i) Grouped Frequency Distribution:-

By scanning the data we find the largest number of baby born is "10" and smallest number is "0" so that the range is;

$$\begin{aligned}\text{Range} &= \text{largest value} - \text{Smallest value} \\ &= 10 - 0 \\ &= 10\end{aligned}$$

Suppose we take "6" classes of equal size so, width of class interval would be

$$\frac{10}{6} \Rightarrow 1.66 \Rightarrow (2)$$

Frequency Distribution of Number of Children born.

Class	Class Boundaries	Tally	Frequency.
0-1	-0.5-1.5		5
2-3	1.5-3.5		22
4-5	3.5-5.5		12
6-7	5.5-7.5		7
8-9	7.5-9.5		3
10-11	9.5-11.5		1
			50

ii-

Ungrouped Frequency Distribution:-

By Scanning of data we find that the number of children born is a discrete variable and the range is small so that the data can conveniently be sorted by taking value of classes is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

The frequency distribution is constructed as;

Number of Children Born	Tally	Frequency (f).
0		1
1		4
2		5
3		5
4		5
5		5
6		5
7		5
8		5
9		5
10		5
		50

→ Median For group Data:-

$$\text{Median} = l + \frac{h}{f} \left(\frac{n}{2} - c \right) \rightarrow (A)$$

l = lower class boundaries.

h = class interval

f = frequency.

Putting the values;

$$\frac{n}{2} \text{ term} \Rightarrow \frac{50}{2} = 25$$

$$\text{low class boundary} = 1.5$$

$$\text{upper} = = = 3.5$$

$$\text{Class boundary} = 3.5 - 1.5 = 2.$$

$$f = 22$$

$$c = 5$$

Putting the value in equation (A)

$$= 1.5 + \frac{2}{22} (25 - 5)$$

$$= 1.5 + \frac{2}{22} (20)$$

$$= 1.5 + 1.82$$

$$\text{Median} = 3.32 \text{ (grouped data)}$$

Median ungrouped data;

Arranged the data in Ascending order.

0 1 1 1 1 2 2 2 2 2 2 2 3 3 3
3 3 3 3 3 3 3 3 3 3 4 4 4 4 4
4 4 5 5 5 5 5 6 6 6 6 7 7 7 8 8
9 10.

$$\text{Median} = \frac{n}{2} \Rightarrow \frac{50}{2} = 25^{\text{th}} \text{ value}$$

$$\Rightarrow 25^{\text{th}} \text{ value} \Rightarrow \boxed{3}$$

Mode of ungrouped data:-

Maximum frequency number of ungrouped data is called mode

$$\text{Mod} = 3$$

which is used 14

time.

Mode of grouped data:-

$$\text{mode} = l + \frac{f_m - f_0}{2f_m - f_1 - f_0} \times h$$

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

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

$$\text{Mode} = 2.76.$$

Question NO # 02

Classes	Class Boundaries	Frequency (f)	Cumulative Frequency
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

$$\Sigma = 50$$

$$Q_1 = \frac{n}{4} \Rightarrow \frac{50}{4} = 12.5$$

12.5 lies in 5-9 class boundary

So,

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

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

$$= 5 + 0.30 (9.5)$$

$$= 7.85$$

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

25 lies in 13-17 class boundaries

So

$$Q_2 = l + \frac{h}{f} \left(\frac{2n}{4} - c \right)$$

$$= 13 + \frac{4}{10} \left(\frac{2 \times 50}{4} - 22 \right)$$

$$= 13 + \frac{4}{10} (3)$$

$$= 13 + 1.2$$

$$Q_2 = 14.2$$

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

37.5 lies in 21-25 class boundaries.

So,

$$Q_3 = l + \frac{h}{f} \left(\frac{3n}{4} - c \right)$$

$$= 21 + \frac{4}{3} \left(\frac{3 \times 50}{4} - 37 \right)$$

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

$$= 21 + 0.67$$

$$Q_3 = 21.67.$$

Deciles:-

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

4 lies in 5-9 class boundaries

Hence

$$D_1 = l + \frac{h}{f} \left(\frac{n}{10} - c \right)$$

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

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

$$= 5 + 0.61$$

$$D_1 = 5.61.$$

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

10 lies in 5-9

Hence

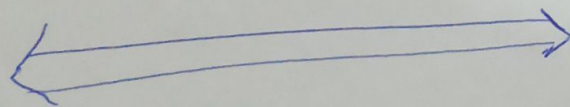
$$D_2 = l + \frac{h}{f} \left(\frac{2n}{10} - c \right)$$

$$D_2 = 5 + \frac{4}{13} \left(\frac{2 \times 50}{10} - 3 \right)$$

$$= 5 + \frac{4}{13} (7)$$

$$= 5 + 2.15$$

$$D_2 = 7.15$$



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

15 lies in 5-9 class Boundaries.

Hence

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

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

$$D_3 = 5 + \frac{4}{13} (12)$$

$$D_3 = 5 + 3.69$$

$$D_3 = 8.69$$

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

20 lies in 9-13 class boundary

Hence

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

$$= 9 + \frac{4}{6} \left(\frac{4 \times 50}{10} - 16 \right)$$

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

$$D_4 = 9 + 2.67$$

$$D_4 = 11.67.$$

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

25 lies in 13-17 class boundaries.

Hence

$$D_5 = l + \frac{h}{f} \left(\frac{S_n}{10} - c \right)$$

$$D_5 = 13 + \frac{4}{10} \left(\frac{5 \times 50}{10} - 22 \right)$$

$$D_5 = 13 + \frac{4}{10} (3)$$

$$D_5 = 14.2.$$

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

30 lies in 13-17 class boundaries

Hence

$$D_6 = l + \frac{h}{f} \left(\frac{6n}{10} - c \right)$$

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

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

$$D_6 = 16.2.$$

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

35 lies in 17-21 class boundaries

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

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

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

$$D_7 = 17 + 2.9$$

$$D_7 = 19.4$$

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

40 lies in 21-25 class boundaries

Hence

$$D_8 = l + \frac{h}{f} \left(\frac{8n}{10} - C \right)$$

$$= 21 + \frac{4}{3} \left(\frac{8 \times 50}{10} - 37 \right)$$

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

$$= 21 + 4$$

$$D_8 = 25$$

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

45 lies in 25-29 class boundaries

Hence

$$D_9 = 1 + \frac{4}{4} \left(\frac{9n}{10} - 2 \right)$$

$$D_9 = 25 + \frac{4}{5} \left(\frac{9 \times 50}{10} - 40 \right)$$

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

$$D_9 = 25 + 4$$

$$D_9 = 29$$

Answer NO # 03

(a) Random Statistics ::

In Statistics a random variable is an Assignment of Numerical value to each possible outcome of an event space. This Association facilitate and the Identification & the calculation of probabilities.

(b) Inferential Statics :-

Inferential statics is a branch of statistics through which we collect the data, analysis the data, summarize the data

Interpretate the data and
tabulate the data to get
Precise result in non-numerical
form.

By using inferential statistics
we draw inference about the
Characteristics of related problem
in our inference gives non-numerical
result.

(C) Descriptive Statistics.

Descriptive statistics can
be define as the collection of
data, analysis of data, Summarization
of data, tabulation of data at
last we get precise in
Numerical form is called
Descriptive Statistics.

OR ::

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

D) Source of Primary Data:

- i- Direct personal investigation.
- ii- Indirect investigation.
- iii- Interior Method.
- iv- Collection through Enumerator.
- v- Questionos Method.
- vi- Collection through local sources.
- vii- Computer interview Method.

(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: Student are classified as male and female. we may use Number "1" and "2"

ii- Rainfall may be classified as Heavy, moderate and light. we may used Number 1, 2, and 3.

The Number when they are used only Identify the categories.

In this Scale no particular order is used.