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SEMESTER

10<sup>th</sup>

PAPER

PROBABILITY

DATE

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QUESTION No 1:

①

Answer: Grouped Frequency distribution:

By scanning the data,

We find that 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" class of equal size so;

width of equal class interval would be  $10/6 = 1.66 \Rightarrow \textcircled{2}$

Frequency Distribution of number of children born.

CLASS	CLASS Boundries	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 the data, we can find that the number of children born is a discrete variable and the range is small, so that the data can be conventionally sorted by taking the values of classes

as 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

the frequency distribution is then constructed

as;

Number of children born	Tally	Frequency
0	I	1
1	IIII	4
2	IIII II	8
3	IIII II III	14
4	IIII II	7
5	IIII I	5
6	IIII	4
7	IIII	3
8	IIII	2
9	I	1
10	I	1
		50

(P.T.O)

b) Median of group data:

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

$l$  = lower class boundary

$h$  = class interval

$f$  = Frequency

putting the values

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

lower class boundary = 1.5

upper class boundary = 3.5

$$\text{class boundary} = 3.5 - 1.5 = 2$$

$$f = 22$$

$$c = 5$$

put the values

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

$$= 1.5 + \frac{20}{11}$$

= 1.5 + 1.82

Median = 3.32 (grouped data)

→ Median of ungrouped data:

Arrange data in ascending order.

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

Median =  $\frac{n}{2}$

=  $\frac{50}{2}$

= 25<sup>th</sup> values = 3

→ Mode of ungrouped data:

Maximum number of the ungrouped data is called mode.

Mode = 3 → which is used  
in 14 times

→ Mode of grouped data:

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

Putting the values

$$= \cancel{1.5 + 22 - 0.2}$$

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

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

$$\text{Mode} = 2.76$$

QUESTION NO 2:

(7)

Answer:

Classes	class boundaries	Frequency (F)	Commulative Frequency (c.F)
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

$\Sigma = 50$



# QUANTILES;

(8)

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

12.5 lies in 5-9 class boundary.

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

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

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

$$= 5 + 0.030 (9.5)$$

$$Q_1 = 7.85$$

$$Q_2 = \frac{2n}{4}$$

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

25 lies in 13-17 class boundary

So;

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

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

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

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

$$= 13 + 1.2$$

$$Q_2 = 14.2$$

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

37.5 lies in 21-25 class boundary.

So;

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

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

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

$$Q_3 = 21.67$$

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DECILES;

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

4 lies in 5-9 class - boundary

Hence

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

$$D_1 = 5 + \frac{4}{13} \left( \frac{50}{10} - 3 \right)$$

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

$$D_1 = 5.61$$

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

10 lies in 5-9

Hence,

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

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

$$D_2 = 5 + \frac{4}{13} (7)$$

$$D_2 = 7.15$$

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

15 lies in 5-9 class boundary

Hence

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

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

$$D_3 = 8.69$$

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

20 lies in 9-13 class boundary

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

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

$$D_4 = 11.67$$

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

25 lies in 13-17 class boundary

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

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

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

$$D_5 = 14.2$$

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

30 lies in 13-17 class boundary

$$\begin{aligned}
D_6 &= l + \frac{b}{f} \left( \frac{6n}{10} - c \right) \\
&= 13 + \frac{4}{10} \left( \frac{6 \times 50}{10} - 22 \right) \\
&= 13 + \frac{4}{10} (30 - 22) \\
&= 13 + \frac{4}{10} (8)
\end{aligned}$$

$$D_6 = 16.2$$

Hence;

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

35 lies in 17-21 class boundary;

so;

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

$$D_7 = 17 + \frac{4}{5} (35 - 32)$$

$$D_7 = 19.4$$

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

40 lies in 21-25 class boundary

Hence;

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

$$= 21 + \frac{4}{3} (40 - 37)$$

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

$$\boxed{D_8 = 25}$$

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

45 lies in 25-29 class boundary

Hence;

$$D_9 = l + \frac{b}{f} \left( \frac{9n}{10} - c \right)$$

$$Dq = I + \frac{h}{f} \left( \frac{qn}{10} - c \right)$$

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

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

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

$$Dq = 25 + 4$$

$Dq = 29$
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Q No 3: Define the following:

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1) Random Statistics:

"Random Sampling" is a part of the sampling technique in which each sample has an equal probability of being chosen. A sample chosen randomly is meant to be an unbiased representation of the total population. If for some reasons, the sample does not represent the population, the variation is called sampling error!

2) Inferential Statistics:

"Inferential" 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 a precise result in non-numerical form."

OR:

"The process of reaching generalization about the whole by examining a portion is called Inferential Statistics."

3) DESCRIPTIVE STATISTICS:

Descriptive statistics

Can be define as;

"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 Statistics."

OR;

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

4) SOURCES of Primary data:

- I) Direct personal investigation.
- II) Interview method
- III) Questioner method
- IV) Indirect investigation
- V) Collection through Enumerators.
- VI) Collection through local sources.
- VII) Computer interview method.

## 5) Nominal Scale:

It can be define as;

"The classification of the observations into mutually exclusive quantitative classes is said to be nominal scale."

### Examples:

1  $\Rightarrow$  students are classified as male and female. we may use number 1 and 2.

2  $\Rightarrow$  Rainfall may be classified as heavy moderate and light.

we may use number 1, 2, and 3.

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

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