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QNo. 1 Part (1)

i) Grouped Frequency Distribution.

By scanning the data, we find

that the largest number of

baby born is "10" and the

smallest number is "0" so

that the range is: ^{value}

Range = Largest value - smallest

$$= 10 - 0 = 10$$

Suppose we take "6" classes of equal size.

So; width of equal class

interval would be $10/6$

$$= 1.66 \rightarrow (2)$$

Frequency	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
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ii) ungrouped Frequency Distribution.

By scanning the data, we

find that the number of

children born is a discrete variable and the range is small, so that the data can be conveniently 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:

No. of children born	Tally	F
0		1
1		4
2	 	8
3	 	14
4	 	7
5		5
6		4
7		3
8		2
9		1
10		1

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Part (2)

Class	C.B	F	C.F
0-1	0.5-1.5	5	5
2-3	1.5-3.5	22	27
4-5	3.5-5.5	12	39
6-7	5.5-7.5	7	46
8-9	7.5-9.5	3	49
10-11	9.5-11.5	1	50

$$\Sigma f = 50$$

Mode & Median

(a) For Grouped Data

For Even Terms

$$\begin{aligned}\rightarrow \text{Median} &= l + \frac{h}{f} \left(\frac{n}{2} - c \right) \\ &= 1.5 + \frac{2}{22} \left(\frac{50}{2} - 5 \right) \\ &= 1.5 + \frac{2}{22} (25 - 5)\end{aligned}$$

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

$$= 1.5 + \frac{40}{22}$$

$$= 1.5 + 1.81$$

$$= 3.31$$

→ Mode

$$l + \frac{(f_m - f_1)}{(f_m - f_1) + (f_m - f_2)} \times h$$

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

$$\frac{17}{17 + 10}$$

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

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

$$= 1.5 + 0.63 \times 2 = 1.5 + 1.26 = 2.76$$

Mode & Median

B) For ungrouped Data.

Mode is the most repeated Term.

So, Mode = 3 B/cuz "3" is most repeated Term.

For Median, Arrange The Terms.

0, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3

3, 3, 3, 3, 3, 3, 3, 3, ^{25th}3, ^{26th}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.

Now; Median

$$M = \frac{(n/2)^{\text{th}} + (n/2 + 1)^{\text{th}}}{2}$$

$$M = \frac{(50/2)^{\text{th}} + (50/2 + 1)^{\text{th}}}{2}$$

$$M = \frac{25^{\text{th}} \text{ term} + 26^{\text{th}} \text{ term}}{2}$$

$$M = \frac{3+3}{2} = \frac{6}{2} \Rightarrow \boxed{M = 3}$$

Q No. 2

Classes	class boundaries	f	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

$$\Sigma = 50$$

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

So, 12.5 lies in 5-9 C.B

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

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

$$= 5 + 30 (12.5 - 3)$$

$$= 5 + .30 (9.5)$$

$$= 7.85$$

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

25 lies in 13-17 C.B

So;

$$Q_2 = l + \frac{h}{f} \left(\frac{2n}{4} - c \right)$$
$$= 13 + \frac{4}{10} \left(\frac{2 \times 50}{4} - 22 \right)$$

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

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

$$= 13 + 1.2$$

$$Q_2 = 14.2$$

$$Q_3 = \frac{3n}{4} \Rightarrow \frac{30 \times 50}{4} \Rightarrow 37.5$$

37.5 lies in 21-25 C.B

So;

$$\begin{aligned}Q_3 &= l + \frac{h}{f} \left(\frac{3n}{4} - c \right) \\&= 21 + \frac{4}{3} \left(\frac{3 \times 50}{4} - 37 \right) \\&= 21 + \frac{4}{3} (37.5 - 37) \\&= 21 + \frac{4}{3} (0.5) \\&= 21 + 0.67\end{aligned}$$

$$Q_3 = 21.67$$

'Deciles'

$$D_1 = \frac{n}{10} = \frac{50}{10} = 5$$

5 lies in 5-9 c.B

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

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

$$= 5 + 0.61$$

$$D_1 = 5.61$$

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

10 lies in $\bar{5}-9$

Hence;

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

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

$$D_2 = 5 + \frac{4}{13} (10 - 3)$$

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

$$D_2 = 5 + 2.15$$

$$D_2 = 7.15$$

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

15 lies in $\bar{5}-9$ C.B

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

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

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

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

$$D_3 = 5 + 3.69$$

$$D_3 = 8.69$$

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

20 lies in 9-13 class boundaries

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

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

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

$$D_4 = 9 + 2.67$$

$$D_4 = 11.67$$

$$D5 = \frac{5n}{10} \Rightarrow \frac{5 \times 50}{10} = 25$$

25 lies in 13-17 C.B

$$\text{Hence } D5 = l + \frac{h}{f} \left(\frac{5n}{10} - c \right)$$

$$D5 = 13 + \frac{4}{10} \left(\frac{5 \times 50}{10} - 22 \right)$$

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

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

$$= 14.2$$

$$D6 = \frac{6n}{10} \Rightarrow \frac{6 \times 50}{10} = 30$$

30 lies in 13-17 C.B

Hence;

$$D6 = l + \frac{h}{f} \left(\frac{6n}{10} - c \right)$$

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

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

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

$$= 13 + 3.2$$

$$= 16.2$$

$$D7 = \frac{7n}{10} \Rightarrow \frac{7 \times 50}{10} \Rightarrow 35$$

35 lies in 17-21 class

Hence

$$D7 = 17 + \frac{4}{5} \left(\frac{7 \times 50}{10} - 32 \right)$$

$$D7 = 17 + \frac{4}{5} (35 - 32)$$

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

$$= 17 + 2.4$$

$$= 19.4$$

$$D8 = \frac{8n}{10} \Rightarrow \frac{8 \times 50}{10} \Rightarrow 40$$

40 lies in 21-25 C.B

Hence

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

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

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

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

$$= 21 + 4$$

$$D_8 = 25$$

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

45 lies in 25-29 C.B

Hence.

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

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

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

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

$$D_9 = 25 + 4$$

$$D_9 = 29$$

Part (a) Random Statistics:

In The common parlance, randomness is The apparent lack of pattern or predictability in events.

A random sequences of events, symbols or steps often has no order & does not follow an intelligible pattern or combination.

Q No. 3

Part (b) Inferential statistics:

Inferential statistics deals with procedures for making inferences about the characteristics that describe the large group of data or the whole, called the population, from the knowledge derived from only a part of the data, known as sample.

This area includes the estimation of population parameters and testing of statistical hypotheses. This phase of statistics is

based on Probability Theory as the inferences which are made on the basis of sample evidence.

Part (c) Descriptive Statistics:-

Descriptive statistics is that branch of statistics which deals with concepts and methods concerned with summarization and description of the important aspects of numerical data. This area of study consists of the condensation of data. Their graphical displays

and The computation of a few numerical quantities that provide information about The center of The data and indicate The spread of The observation.

Part (D) Sources of Primary Data:-

- i) Direct Personal Investigation.
- ii) Indirect Investigation.
- iii) Interview method.
- iv) collection Through Enumerators.
- v) Questiones method.
- vi) collection Through local sources.
- vii) computer interview method.

Primary Data:

The data collected for the first time and original in character is called Primary data.

"OR"

The data is original raw form is called Primary data.

Part (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:

→ students are classified as male & female. we may use number 1 & 2.