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Statistics

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Q (3)

Ans (1)

### Descriptive Statistics:-

The collection of data, analysis of data, Summarization of data, interpretation of data, tabulation of data at least we get a precise result in numerical form is called descriptive statistics.

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

### (2) Inferential Statistics:-

Inferential Statistics 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.

The process of reaching generalizations about the whole by examining a portion is called inferential statistics.

### (3) Sources of primary data:-

The following are the sources of primary data.

- (1) Direct personal investigation.
- (2) Indirect investigation.
- (3) Interview Method.
- (4) Collection through Enumerators.
- (5) Questioner Method.
- (6) Collection through local sources.
- (7) Computer interview method.

### (4) Nominal Scale:-

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

For example:-

Rainfall may be classified as heavy, moderate and light. We may use Number 1, 2 and 3.

## 5) Random Statistics:

The field of mathematics, probability, and statistics use formal definitions of random-ness. In statistics, a random variable is an assignment of a numerical value to each possible outcome of an event space. This association facilitates the identification and the calculation of probabilities.

P#04

Q 2 Calculate quartiles & deciles.

Ans

Class	N	f	Cf
2-4	3	3	3
6-8	7	13	16
10-12	11	6	22
14-16	15	10	32
18-20	19	5	37
22-24	23	3	40
26-28	27	5	45
30-32	31	3	48
34-36	35	2	50

As we know that.

$$Q1 = \left[ \frac{n}{4} \right]^{th} \quad \because n = 50$$

$$Q1 = \frac{50}{4} = 12.5$$

So, the considered class is (6-8)

$$L = 6, h = 2, C.f = 3, n = 50$$

P# 05

As we know:-

$$Q_1 = L + \frac{h}{f} \left[ \frac{n}{4} - ct \right]$$

Putting values

$$Q_1 = 6 + \frac{2}{13} \left[ \frac{50}{4} - 3 \right]$$

$$Q_1 = 12.33$$

Now [Q2]

$$Q_2 = 2 \left[ \frac{n}{4} \right]^{th}$$

$$Q_2 = 2 \left[ \frac{50}{4} \right]^{th} = 25$$

Putting values in equation:-

$$Q_2 = 14 + \frac{2}{10} \left[ \frac{2(50)}{4} - 22 \right]$$

$$Q_2 = 14.6$$

Now [Q3]

$$Q_3 = 3 \left[ \frac{n}{4} \right]^{th}$$

P# 08

$$Q_3 = 3 \left[ \frac{50}{4} \right]^{\text{th}}$$

$$Q_3 = 37.5$$

Now for Deciles  $[D_1]$

As we know

$$D_1 = \left[ \frac{n}{10} \right] \quad \therefore n = 50$$

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

putting value in equation.

$$D_1 = 6 + \frac{2}{13} \left[ \frac{50}{10} - 3 \right]$$

$$D_1 = 6.30$$

$[D_2]$

$$D_2 = 2 \left[ \frac{n}{10} \right]$$

$$D_2 = 2 \left[ \frac{50}{10} \right]$$

$$D_2 = 10$$

P#07

Now putting values:

$$D_2 = 6 + \frac{2}{13} \left[ \frac{2(50)}{10} - 3 \right]$$

$$D_2 = 7.07$$

$$[D_3]$$

$$D_3 = 3 \left[ \frac{n}{10} \right]^{th}$$

$$D_3 = 3 \left[ \frac{50}{10} \right] = 15$$

Now putting values in equation

$$D_3 = 6 + \frac{2}{13} \left[ \frac{3(50)}{10} - 3 \right]$$

$$D_3 = 7.84$$

$$[D_4]$$

$$D_4 = 4 \left[ \frac{n}{10} \right]^{th}$$

$$D_4 = 4 \left[ \frac{50}{10} \right] = 20$$



P-# 08

So, Putting values in equation.

$$D_4 = 10 + \frac{2}{6} \left[ \frac{4(50)}{10} - 16 \right]$$

$$D_4 = 11.33$$

[D5]

$$D_5 = 5 \left[ \frac{50}{10} \right] = 25$$

Putting values

$$D_5 = 14 + \frac{2}{10} \left[ \frac{5(50)}{10} - 22 \right]$$

$$D_5 = 14.6$$

[D6]

$$D_6 = 6 \left[ \frac{n}{10} \right]^{\text{th}} = 6 \left[ \frac{50}{10} \right]$$

$$D_6 = 30$$

Putting values

$$D_6 = 14 + \frac{2}{10} \left[ \frac{6(50)}{10} - 22 \right]$$

$$D_6 = 18.6$$

P# 09

[D7]

$$D7 = 7 \left[ \frac{n}{10} \right] = 7 \left[ \frac{50}{10} \right]$$

$$D7 = 35$$

Putting values

$$D7 = 18 + \frac{2}{5} \left[ \frac{7(50)}{10} - 32 \right]$$

$$D7 = 19.2$$

[D8]

$$D8 = 8 \left[ \frac{n}{10} \right] = 8 \left[ \frac{50}{10} \right]$$

$$D8 = 40$$

Putting values

$$D8 = 22 + \frac{2}{3} \left[ \frac{8(50)}{10} - 37 \right]$$

$$D8 = 24$$

P#10

[D<sub>9</sub>]

$$D_9 = 9 \left[ \frac{n}{10} \right] = 9 \left[ \frac{50}{10} \right] = 45$$

Putting Value

$$D_9 = 26 + \frac{2}{5} \left[ \frac{9(50)}{10} - 40 \right]$$

$$\boxed{D_9 = 28}$$

P # 11

Q 1

Sol:-

Largest Value = 10

Smallest Value = 0

Range = largest.v - smallest.v

Range =  $10 - 0 = 10$

Take 5 classes of equal stepsize

thus,

$$h = \frac{10}{5} = 2$$

$$\boxed{h=2}$$

Class Weight	Class boundaries	Mid-point	Tally	f	C.f
0-2	0.5-2.5	1.5		13	13
3-5	2.5-5.5	4	 	25	38
6-8	5.5-8.5	7		10	48
9-11	8.5-11.5	10		2	50

Median:

Even number so

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

$$= 25, h=2, f=25, c.f=13$$

$$= 1 + h \left( \frac{n}{2} - c.f \right)$$

$$= 1 + \frac{2}{25} (25 - 13)$$

$$\boxed{\text{Median} = 1.96}$$

Mode:

$$M = L + \frac{f_m - f_1}{(f_m - f_1) + (f_m - f_2)} \times h$$

$$l=2.5, f_m=25, f_1=13, f_2=10$$

$$h=2$$

$$= 2.5 + \frac{25 - 13}{(25 - 13) + (25 - 10)} \times 2$$

$$\boxed{M = 3.38}$$

Number	Frequency	Commulative freq.	Tally
0	1	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	1
10	1	50	1
$\Sigma$	50		

In ungrouped data the highest frequency is 14 thus the number of children corresponding is 3

Thus, mode = 3

Median: Since the data is even

Thus,  $\frac{n}{2} = \frac{50}{2}$

Median = 25