Day. M T W T F S 7722. Date: __/__/__

Mid term Examination Summer 2020

Subject probability & Statistics.

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Submitted : To Engr anwar Shamim
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Q1 Q NO# Solution:

Grouped frequency Destribution

maximum value = 10

minimum value = 0

Range = 10 - 0 = 10

We deciade to take classes of Equal Size

$h = \frac{10}{5} = 2$ say 2.1

$h = 2.1$

Class weight	class boundry	mid-point	tally	
0 - 2	-0.05 - 2.05	1	𝍸 𝍸 III	13
2.1 - 4.1	2.05 - 4.15	3.1	𝍸 𝍸 𝍸 I	21
4.2 - 6.2	4.15 - 6.25	5.2	𝍸 IIII	9
6.3 - 8.3	6.25 - 8.35	8.3	𝍸	5
8.4 - 10.4	8.35 - 10.45	9.4	II	2
				50

next

C. frequency
13
34
43
48
50.

Using rouped data:

Net page,

Ungrouped data

Number of classes	tally	frequency	c.f
0	I	1	1
1	IIII	4	5
2	IIII III	8	13
3	IIII IIII III	14	27
4	IIII II	7	34
5	III	5	39
6	IIII	4	43
7	III	3	46
8	II	2	48
9	I	1	49
10	I	1	50

Grouped data frequency distribution

Part (B)

Sol:- Mod.

$$m = l + \frac{fm - f_1}{(fm - f_1) + (fm - f_2)} \times h \quad \text{---(1)}$$

$l = 2.05$

$fm = 21$

$f_1 = 13$

$f_2 = 9$

$h = 2.1$

$$m = 2.05 + \frac{(21 - 13)}{(21 - 13) + (21 - 9)} \times 21$$

$m = 2.89 \approx 3$

Mode = 3

Median

First we check $\frac{n}{2}$

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

So

$l = 2.05$

$h = 2.1$

$f = 21$

$c = 13$

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

$$= 2.05 + \frac{2.1}{21}\left(\frac{50}{2} - 13\right)$$

$$= 3.25 \simeq 3$$

Median = 3

Ungrouped frequency distribution.

Mode.

In ungrouped data the highest frequency is 14 So the number of children in front of 14 is 3

Thus **Mod = 3**

median. Our data is even as it is 50 so

$$\text{median} = \frac{n}{2} \Rightarrow \frac{50}{2}$$

Median = 25th value

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the data wich is primary called Secondary data.

Day: M T W T F S Date: / / 5

Q02 Q No#

Calculate Quartiles and deciles

Class	class boundry x	f Classboundry x	c frequancy f	Comulative frequancy cf
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
			$\Sigma = 50$	

Quartiles

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

12.5 lies in 5 – 9 class boundry

So

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

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

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

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$= 5 + .30 (9.5)$

$= 7.85$

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

25 lies in 13 – 17 class boundry

So

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

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

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

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

$= 13 + 1.2$

$Q_2 = 14.2$

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

37.5 lies in 21 – 25 class boundry

So

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

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

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

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

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$= 21 + 6.67$

$Q_3 = 21.67.$

Deciles

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

4 lies in 5–9 class boundry.

Hence.

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

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

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

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

$5 + 0.61$

$\boxed{D_1 = 5.61}$

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

10 lies in 5–9

Hence

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

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

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

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

$D_2 = 5 + 2.15$

$D_2 = 7.15$

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

15 lies in 5 – 9 class boundry

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

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

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

$D_3 = 5 + 0.307(12)$

$D_3 = 5 + 3.69$

$D_3 = 8.69$

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

20 lies in 9 – 13 class boundry

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

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

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

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$D_4 = 9 + 2.67$

$\boxed{D_4 = 11.67}$

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

25 lies 13 — 17 class boundry.

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

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

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

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

$\boxed{D_5 = 14.2}$

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

30 lies in 13 — 17 class boundry

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

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

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

$D_6 = 13 + \frac{4}{10}(8)$

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Day. M T W T F S Date: __/__/__ 10

$= 13 + 3.2$

$D_6 = 16.2$

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

35 lies in 17 – 21 (class boundry)

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

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

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

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

$D_7 = 17 + 2.9$

$D_7 = 19.4$

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

40 lies in 21 – 25 class boundry)

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

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

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

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

$= 21 + 4$

$\boxed{D8 = 25}$

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

45 lies in 25 – 29 class boundary.

Hence

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

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

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

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

$$Dq = 25 + 4$$

$$\boxed{Dq = 29}$$ proved

Day: M T W T F S Date: 19/08/2020 12

Q3
Q No# Define the following term?

Ans: (a) Random Statistics:

in Statistics a random variable is an assignment Numerical value to each possible out come of a event Space.
this association facilited
The Identification and the Calculation of probability of the event.

(b) Inferential Statistics

Inferential Statistics is a branch of Statistics through which we Collect the data, analysis the data, Summarize the data, Interpretation of the data and tabulate the data to get precies result in non numerical

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Day. M T W T F S Date: / / 13

form is called Inferential Statistics.

(C) Descriptive Statistics:

the collection of data, Summarization of data, interpretation of data, tabulation of data at last we get a precise result in numerical form called descriptive Statistics.

(d) Source of primary data:

1. Direct personal investigation
2. Indirect Investigation.
3. Interview method.
4. Collection through Enumerators Question method.
5. Collection through local Source.
6. Computer Interview Method.

(e) Nominal Scale

it can be define as "the classification of the observation in to mutually exclusive (p to)

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Day: M T W T F S

Date: __/__/__ 14

Qualative class is said to be nominal Scale.

eg) Students are classified as male and female we may use number 1 and 2.

ii) Rain fall may be classified as heavy, modrate and light. We may use number 1 and 2.

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