

Name

Ramgar Khan

ID

12808

Semester

8th

Subject

Basic Statistics

Submitted to: Mr. Raza Ahmed Khan

Dated: 22/9/2020

Q No 1 :- ^① Take 100 Observations randomly and Construct the following?

Ans:-

★ Discrete group Frequency distributing table.

★ Continuous class boundaries tables

10	8	8	5	6	3	3	3	10	1
20	19	19	13	12	12	11	17	19	6
30	22	22	23	27	29	30	25	24	25
33	32	34	35	35	37	39	40	39	38
50	50	50	47	47	47	43	42	41	47
59	58	57	57	57	52	53	52	52	60
70	69	68	65	65	62	65	62	62	70
80	80	80	76	75	75	73	72	71	80
89	87	86	88	85	84	84	82	82	90
96	95	96	95	96	100	96	98	99	98

$$\begin{aligned}
 \text{① Range} &= \text{Highest} - \text{Lowest} \\
 &= 100 - 1 \\
 &= 99
 \end{aligned}$$

(2) Class interval keeping at 9:
Frequency distribution table.

No of observation class	Frequency
10-100	10
11-20	10
21-30	10
31-40	10
41-50	10
51-60	10
61-70	10
71-80	10
81-90	10
91-100	10

Q No 2 :- Find average of the above mentioned frequency distribution table?

Ans :-

* Arithmetic mean

Arithmetic mean = $\frac{\text{Sum of all Observation}}{\text{No. of observation}}$

$$= \frac{5190}{100}$$

Arithmetic mean = 51.9

* Geometric mean.

Class	Class boundaries	Mid value (M _i)	Freq (F _i)	Log (x _i)	F _i Log (x _i)
0-10	0.5-10.5	5	10	0.6989	6.989
11-20	10.5-20.5	15	10	1.1761	11.761
21-30	20.5-30.5	25	10	1.3979	13.979
31-40	30.5-40.5	35	10	1.544	15.44
41-50	40.5-50.5	45	10	1.653	16.53
51-60	50.5-60.5	55	10	1.74	17.4
61-70	60.5-70.5	65	10	1.813	18.13
71-80	70.5-80.5	75	10	1.875	18.75
81-90	80.5-90.5	85	10	1.929	19.29
91-100	90.5-100.5	95	10	1.9777	19.777

★ Continuous Class ⁽⁴⁾ boundaries table

Classes	class boundaries	Frequency
0-10	0.5-10.5	10
11-20	10.5-20.5	10
21-30	20.5-30.5	10
31-40	30.5-40.5	10
41-50	40.5-50.5	10
51-60	50.5-60.5	10
61-70	60.5-70.5	10
71-80	70.5-80.5	10
80-90	80.5-90.5	10
91-100	90.5-100.5	10

$$\text{Geometric mean} = \frac{1}{N} \sum_{i=1}^n f_i \cdot \log(x_i)$$

$$= \frac{158.046}{100}$$

$$\text{Geometric mean} = 1.58046$$

Mode: Mode is 96

Q No 3:- Find Quantile of the discrete frequency distribution table?

Classes	Frequency	CF
1-10	10	10
11-20	10	20
21-30	10	30
31-40	10	40
41-50	10	50
51-60	10	60
61-70	10	70
71-80	10	80
81-90	10	90
91-100	10	100

Q:1 Class: $\frac{n}{4}$

$= \frac{100}{4} = 25$

class (21-30)

The lower boundary of class

21-30 is 21

$$L = 21$$

$$Q_1 = L + \frac{n}{4} + CF \times C$$

$$Q_1 = 21 + \frac{25 - 30}{10} \times 9$$

$$21 + \frac{-5}{10} \times 9$$

$$21 + (-0.5 \times 9)$$

$$21 + (-4.5)$$

$$Q_1 = 16.5$$

$$Q_{s2} = \text{class} = \frac{2n^{th}}{4}$$

$$\frac{2(100)}{4} = 50$$

$$\text{class} = 41 - 50$$

class 41-50 lower limit is

41

Class	Frequency (f)	Cumulative Frequency (CF)
1-10	10	10
11-20	10	20
21-30	10	30
31-40	10	40
41-50	10	50
51-60	10	60
61-70	10	70
71-80	10	80
81-90	10	90
91-100	10	100

Q₁ = 16.5

Q_{s2} = 50

41

class 41-50

lower limit is 41

Q₁ = 16.5

$$Q_2 = L + \frac{2^n}{4} - CF \times C$$

$$Q_2 = 41 + \frac{50 - 50}{10} \times 9$$

$$Q_2 = 41 + \frac{0}{10} \times 9$$

$$Q_2 = 41$$

Q3:- class $\frac{3^{rd}}{4}$

$$\frac{3(100)}{4}$$

$$= 75$$

$$\text{Class} = 71 - 80$$

Class 71-80 lower limit is 71

$$Q_3 = L + \frac{\frac{3n}{4} - CF}{F} \times C$$

$$Q_3 = 71 + \frac{75 - 80}{10} \times 9$$

$$71 + \frac{-5}{10} \times 9$$

$$= 71 + (-0.5 \times 9)$$

$$71 - 4.5$$

$$Q_3 = 66.5$$

Q. No 4:- Find the following of the discrete group frequency distribution table.

Ans:-

* Range:

$$\text{Range} = \text{maximum} - \text{minimum}$$

$$100 - 1 = 99$$

* Quartile Range

$$Q_3 - Q_1$$

$$\text{interquartile Range} = Q_3 - Q_1$$

$$66.5 - 41 = 25.5$$

Semi-interquartile Range:

$$= Q_3 - Q_1 / 2$$

$$= 66.5 - 41 / 2$$

$$= 25.5 / 2$$

$$\text{Semi-interquartile range} = 12.75$$

★ Variance :

Classes	Mid point x_i	Frequency	$x - \bar{x}$	$x - x_i$
0-10	5	10	-45	2025
11-20	15	10	-35	1225
21-30	25	10	-25	625
31-40	35	10	-15	225
41-50	45	10	-5	25
51-60	55	10	5	25
61-70	65	10	15	225
71-80	75	10	25	625
81-90	85	10	35	1225
91-100	95	10	45	2025

$\sum x_i = 50$

$\sum (x - \bar{x}_i)^2 = 8250$

Variance = $\frac{\sum (x - \bar{x}_i)^2}{100}$

$\frac{8250}{100}$

Variance = 82.5

(11)
Standard deviation

$$S.D = \sqrt{\text{variance}}$$

$$S.D = \sqrt{82.5}$$

$$S.D = 9.08$$

Co-efficient of variance

co-efficiency of variance =

$$S.D / \text{mean} \times 10$$

$$= 9.08 / 50 \times 100$$

$$= 18.16\%$$
