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Statistics

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BBA 3rd Semester

Q:1 :- Take 100 observation randomly and construct the following?

⇒ 100 OBSERVATIONS

5	8	10	12	17	19	20	22	22	23
25	25	27	28	30	32	32	33	35	35
37	38	40	40	42	44	46	48	48	50
52	54	54	55	55	56	57	60	60	62
64	64	66	67	68	70	72	72	74	76
78	78	80	81	82	82	85	86	88	88
90	92	94	94	96	98	98	100	102	104
106	106	108	109	110	112	114	114	116	117
118	120	120	122	124	125	126	128	128	130
132	134	136	136	138	138	140	142	144	146
148									

⇒ • Discrete Group Frequency Distribution Table.
 ⇒ • continuous class boundaries Table

$R = \text{highest No} - \text{lowest No}$

$$R = 148 - 5$$

$$R = 143$$

$$h = \frac{R}{k}$$

$$h = \frac{143}{7}$$

$$h = 20.42$$

$$h = 21$$

$$2^k \geq 100$$

$$2^2 \geq 8 \quad \times \leq 100$$

$$2^3 \geq 18 \quad \times \leq 100$$

$$2^4 = 32 \quad \times \leq 100$$

$$2^5 = 64 \quad \times \leq 100$$

$$2^{\textcircled{7}} = 128 \quad \checkmark > 100$$

$$\boxed{128 \geq 100}$$

$$k = 7$$

No	Classes	Boundaries	Mid-Point	Frequency	Cumulative Frequency	F ₀ X	Flog(x)	F/x
1	5-25	4.5-25.5	15	11	11	165	12.93	0.73
2	26-46	25.5-46.5	36	15	26	540	23.34	0.41
3	47-67	46.5-67.5	57	17	43	969	29.84	0.29
4	68-88	67.7-88.5	78	16	59	1248	30.27	0.20
5	89-109	88.5-109.5	99	14	73	1386	27.93	0.14
6	110-130	109.5-130.5	120	16	89	1920	33.26	0.13
7	131-151	130.5-151.5	140.5	13	102	1826.5	27.91	0.09
					102	8054.5	185.48	1.99

Q:2 Find Average of the above mentioned frequency distribution table:-

• Arithmetic Mean:-

$$\bar{x} = \frac{\sum fx}{N} \text{ or } x = \frac{f_1x_1 + f_2x_2 + \dots + f_nx_n}{N}$$

So we take $\sum fx$

$$A.M = \frac{8054.5}{100}$$

$$A.M = \underline{\underline{80.545}}$$

• Geometric Mean:-

$$\text{Anti log} \left(\frac{\sum f \cdot \log(x)}{N} \right)$$

$$\text{Anti log} \left(\frac{80.545}{100} \right)$$

$$\text{Geometric Mean} = 3.50$$

• Harmonic Mean:-

$$= \frac{\sum f}{\sum \frac{f}{x}}$$

$$= \frac{100}{1.99}$$

$$H.M = 50.25$$

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

$$= l + \frac{h}{f} (50 - c)$$

$$= 67.5 + \frac{21}{16} (50 - 17)$$

$$= 67.5 + 1.31 (33)$$

$$= 67.5 + 43.33$$

$$\text{Median} = 110.73$$

• Mode :-

$$l + \frac{f_2}{f_1 + f_2} \times h$$

$$= 46.5 + \frac{16}{15 + 16} \times 21$$

$$= 46.5 + \frac{16}{31} \times 21$$

$$= 46.5 + \frac{336}{31}$$

$$= 46.5 + 10.83$$

$$\text{Mode} = 57.33$$

Q:3 Find quartile table
Q₁, Q₂ and Q₃

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

$$= l + \frac{h}{f} \left(\frac{100}{4} - c \right)$$

$$= 25.5 + \frac{21}{15} (25 - 11)$$

$$= 25.5 + 1.4 (14)$$

$$= 25.5 + 19.6$$

$$Q_1 = 45.1$$

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

$$= l + \frac{h}{f} \left(\frac{100}{2} - c \right)$$

$$= 67.5 + \frac{21}{16} (50 - 17)$$

$$= 67.5 + 1.31 (33)$$

$$= 67.5 + 43.23$$

$$Q_2 = 110.73$$

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

$$= l + \frac{h}{f} (75 - c)$$

$$= 109.5 + \frac{21}{16} (75 - 73)$$

$$= 109.5 + 1.31 (2)$$

$$= 109.5 + 2.62$$

$$Q_3 = 112.12$$

Q14 find the following
• Range = Highest No - Lowest No
 $R = 148 - 5$
 $= 143$

• Quartile Range:-

$$\begin{aligned} & Q_3 - Q_1 \\ & = 112.12 - 45.1 \\ & = 67.02 \end{aligned}$$

• Semi Quartile Range:-

$$\begin{aligned} & \frac{Q_3 - Q_1}{2} \\ & \frac{112.12 - 45.1}{2} \\ & = \frac{67.02}{2} \\ & = 33.51 \end{aligned}$$