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Dept: Elect/Electrngr

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Question:

① A Study of yellow fever disease [YFD] was conducted. The study was restricted to patients Under the age of 40. One Purpose was to Compare The distribution of cases by age in "group A" To That of "group B"

* The group data are given below.

C.I	Group A	Group B
1-5	0	2
6-10	7	4
11-15	10	7
16-20	2	20
21-25	1	16
26-30	5	10
31-35	4	4

* Calculate (i) The mean and standard deviation of each group (ii) The Coefficient of Variation for each group (iii) which group has less Variable distribution.

$\Sigma f(A) = 29$ $\Sigma f(B) = 63$

M.D = $\frac{\Sigma f|x-\bar{x}|}{\Sigma f}$ - for grouped data.

for A: $\bar{x} = \frac{\Sigma fx}{\Sigma f} = \frac{517}{29} = 17.83$ for "A" $x = 3$

Table of A

CI	f	x	fx	$f\|x-\bar{x}\|$	$f\|x-\bar{x}\|^2$
1-5	0	3	0	0	0
6-10	7	8	56	68.81	676.41
11-15	10	13	130	48.3	233.3
16-20	2	18	36	034	006
21-25	1	23	23	5.17	26.73
26-30	5	28	140	50.85	517.15
31-35	4	33	132	6068	920.52
			517	234.15	2374.17

① mean($\bar{x}$) = $\frac{\Sigma fx}{\Sigma f} = \frac{517}{29} = 17.83 \approx 17$

∴ ① Mean deviation = $\frac{\Sigma f|x-\bar{x}|}{\Sigma F} = \frac{234.15}{29} = 8.07$

② Standard deviation = $\sqrt{\text{variance}}$

$= \sqrt{\frac{\Sigma f(x-\bar{x})^2}{\Sigma f}} = \sqrt{\frac{2374.17}{29}} = 9.05$

③ Coeficient of variation = $\frac{SD}{mean(\bar{x})} \times 100 = \frac{9.05}{17.83} = 51\%$

∴ - 51%

Table for B.

CT	f	x	fx	$f\|x-\bar{x}\|$	$f\|x-\bar{x}\|^2$
1-5	2	3	6	34.28	587.56
6-10	4	8	32	48.56	589.52
11-15	7	13	91	49.78	356.86
16-20	20	18	360	42.8	90.6
21-25	16	23	368	45.76	130.88
26-30	10	28	280	78.6	617.8
31-35	4	33	132	51.44	661.52
			1269		3035.74

mean ($\bar{x}$) : $\frac{\Sigma fx}{\Sigma f} = \frac{1269}{63} = 20.14$

(i) M.D : $\frac{\Sigma f|x-\bar{x}|}{\Sigma f} = \frac{351.42}{63} = 5.58$

(ii) S.D : $\sqrt{\text{Variance}}$

$= \sqrt{\frac{\Sigma f(x-\bar{x})^2}{\Sigma f}} = \sqrt{\frac{3035.74}{63}} = \sqrt{48.19} = 6.94$

(3) Coefficient of variance = $\frac{\text{Standard deviation} \times 100}{\text{mean}(\bar{x})}$

$= \frac{6.94}{20.14} \times 100\% = 34\%$

(4) Group B is the One with less Variable distribution.
~~Or more~~