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IREONA MARTIALS  
 Eng/06/10/27  
 MECHANICAL ENGINEERING

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Solution

Group A

| C-I   | (f)<br>Group A | x  | fx  | $ x-\bar{x} $ | $(x-\bar{x})^2$ | $ x-\bar{x}  \cdot f$ | $f x-\bar{x} $ |
|-------|----------------|----|-----|---------------|-----------------|-----------------------|----------------|
| 1-5   | 0              | 8  | 0   | 14.8          | 219.04          | 0                     | 0              |
| 6-10  | 7              | 8  | 56  | 7.8           | 76.04           | 67.28                 | 68.6           |
| 11-15 | 10             | 13 | 130 | 4.8           | 23.04           | 28.4                  | 48             |
| 16-20 | 2              | 18 | 36  | 0.2           | 0.04            | 0.08                  | 0.4            |
| 21-25 | 10             | 23 | 230 | 5.2           | 27.04           | 70.4                  | 52             |
| 26-30 | 5              | 28 | 140 | 10.2          | 107.04          | 595.2                 | 51             |
| 31-35 | 4              | 33 | 132 | 15.2          | 231.04          | 924.16                | 60.8           |
|       | 29             |    | 617 |               | 2374.16         | 234                   |                |

mean  $\bar{x}_A = \frac{\sum fx}{\sum f} = \frac{617}{29} = 21.27$

The MDA =  $\frac{\sum f|x-\bar{x}|}{\sum f} = \frac{234}{29} = 8.07$

The SDA =  $\sqrt{\frac{\sum (x-\bar{x})^2 \cdot f}{\sum f - 1}} = \sqrt{\frac{2374.16}{29-1}} = 9.21$

Group B

| C-I   | (f)<br>Group B | x  | f(x) | $ x-\bar{x} $ | $ x-\bar{x}  \cdot f$ | $ x-\bar{x} ^2$ | $f x-\bar{x} ^2$ |
|-------|----------------|----|------|---------------|-----------------------|-----------------|------------------|
| 1-5   | 2              | 3  | 6    | 17.1          | 34.2                  | 292.41          | 584.82           |
| 6-10  | 4              | 8  | 32   | 12.1          | 48.4                  | 146.41          | 585.64           |
| 11-15 | 7              | 13 | 91   | 7.1           | 49.7                  | 50.41           | 352.87           |
| 16-20 | 20             | 18 | 360  | 2.1           | 42                    | 4.41            | 88.2             |
| 21-25 | 10             | 23 | 230  | 2.9           | 29                    | 8.41            | 84.1             |
| 26-30 | 10             | 28 | 280  | 7.9           | 79                    | 62.41           | 624.1            |
| 31-35 | 4              | 33 | 132  | 12.9          | 51.6                  | 166.41          | 665.64           |
|       | 63             |    | 1207 |               | 351.3                 |                 | 3055.83          |

mean  $\bar{x}_B = \frac{\sum fx}{\sum f} = \frac{1207}{63} = 19.16$

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QUESTION

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$$\text{The M.D.} = \frac{\sum f(x-\bar{x})}{\sum f} = \frac{267.3}{63} = 5.45$$

$$\text{S.D.} = \sqrt{\frac{\sum f(x-\bar{x})^2}{\sum f}} = \sqrt{\frac{3358.23}{63-1}} = 6.93 = 7.1$$

(ii) The co-efficient variation (CV) for Group A

$$= \frac{\text{S.D.}}{\text{mean}} \times 100$$

$$\text{where S.D.} = 7.2 \text{ \& mean} = 17.8$$

$$\text{CV} = \frac{7.2}{17.8} \times 100 = 51.7$$

For Group B

Co-efficient variation (CV) for Group B

$$= \frac{\text{S.D.}}{\text{mean}} \times 100$$

$$\text{CV} = \frac{7}{20.1} \times 100$$

$$= \frac{700}{20.1} = 84.1$$

The one with the least Co-efficient variation is less variable than, therefore Group B has lesser variable distribution.