



J.K. SHAH[®]
TEST SERIES
Evaluate Learn Succeed

SUGGESTED SOLUTION

FYJC

SUBJECT- STATISTICS

Test Code - FYJ 6076 A

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ANSWER : 1

$$\begin{aligned} \text{(A) } Sk_b &= \frac{Q_3 + Q_1 - 2Q_2}{Q_3 - Q_1} \\ &= \frac{120 + 80 - 2(100)}{40} = \frac{200 - 200}{40} = \frac{0}{40} \\ &= 0 \end{aligned}$$

The Bowley's coefficient of skewness is 0, hence the data is symmetric.

(02)

(B). Given, $Q_3 - Q_2 = 90$

$$Q_2 - Q_1 = 120$$

$$\begin{aligned} \therefore Sk_b &= \frac{(Q_3 - Q_2) - (Q_2 - Q_1)}{(Q_3 - Q_2) + (Q_2 - Q_1)} \\ &= \frac{90 - 120}{90 + 120} \\ &= \frac{-30}{210} \\ &= -\frac{1}{7} \\ &\text{OR} \\ &= -0.143 \end{aligned}$$

(02)

(C). Simplest A.P. is 1, 2, 3

$$Q_1 = 1, Q_2 = 2, Q_3 = 3$$

Here we have to use Bowley's coefficient of skewness

$$\begin{aligned} Sk_b &= \frac{(Q_3 - Q_2) - (Q_2 - Q_1)}{(Q_3 - Q_2) + (Q_2 - Q_1)} \\ &= \frac{(3 - 2) - (2 - 1)}{(3 - 2) + (2 - 1)} \\ &= \frac{1 - 1}{1 + 1} = \frac{0}{2} \\ &= 0 \end{aligned}$$

\therefore The Distribution is symmetric.

(02)

ANSWER : 2

(A). Lower quartile = $Q_1 = 35$

$$\text{Median} = 40$$

$Sk_b = 0$ the distribution is symmetric.

$$Sk_b = \frac{Q_3 + Q_1 - 2Q_2}{Q_3 - Q_1}$$

$$0 = Q_3 + Q_1 - 2Q_2$$

$$Q_3 = 2Q_2 - Q_1$$

$$= 2(40) - 35$$

$$= 80 - 35$$

$$= 45$$

The upper quartile $Q_3 = 45$.

(03)

(B). Mean – mode = 3 (mean – median)

$$100 - \text{mode} = 3(100 - 98.5)$$

$$\text{Mode} = 100 - 4.5$$

$$= 95.5$$

$$Sk_p = \frac{(\text{Mean} - \text{Mode})}{S.D.}$$

$$= \frac{100 - 95.5}{9}$$

$$= \frac{4.5}{9}$$

$$= 0.5$$

$Sk_p > 0$, the distribution is positively skewed.

(03)

ANSWER : 3

(A) Given, $Sk_b = 0.6$

$$Q_3 + Q_1 = 100 \text{(i)}$$

$$\& Q_2 = 38$$

$$\therefore Sk_b = \frac{Q_3 + Q_1 - 2Q_2}{Q_3 - Q_1}$$

$$0.6 = \frac{100-2(38)}{Q_3-Q_1}$$

$$= \frac{100-76}{Q_3-Q_1}$$

$$0.6 = \frac{24}{Q_3-Q_1}$$

$$Q_3 - Q_1 = \frac{24}{0.6}$$

$$= \frac{240}{6}$$

$$Q_3 - Q_1 = 40 \quad \dots\dots\dots(ii)$$

Adding equation (i) and (ii)

$$Q_3 + Q_1 = 100$$

$$\underline{Q_3 - Q_1 = 40}$$

$$2Q_3 = 140$$

$$Q_3 = 70$$

Subtract $Q_3 = 70$ in equation (i)

$$70 + Q_1 = 100$$

$$\therefore Q_1 = 100 - 70$$

$$\therefore Q_1 = 30$$

(04)

(B) Given, mean = 200

$$C.V. = 8\%$$

$$Sk_p = 0.3$$

$$C.V. = \frac{S.D.}{Mean} \times 100$$

$$8 = \frac{SD}{200} \times 100$$

$$\therefore S.D. = 16$$

$$\text{Now, } Sk_p = \frac{Mean - Mode}{S.D.}$$

$$0.3 = \frac{200 - mode}{16}$$

$$4.8 = 200 - Mode$$

$$Mode = 195.2$$

Next, Mean – Mode = 3 (Mean – Median)

$$200 - 195.2 = 3(200 - \text{Median})$$

$$4.8 = 3(200 - \text{Median})$$

$$\frac{4.8}{3} = 200 - \text{Median}$$

$$1.6 = 200 - \text{Median}$$

$$\text{Median} = 198.4$$

(04)

(b)