# DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

**Solutions**

Subject : MATHS
DPP No. :4

## Topic :-STATISTICS

61 **(d)**

Median of new set remains the same as that of the original set.

62 **(a)**

$$\bar{x} = \frac{8+12+13+15+22}{5} = \frac{70}{5} = 14$$

$$\sigma = \sqrt{\frac{(8-14)^2+(12-14)^2+(13-14)^2 + (15-14)^2+(22-14)^2}{5}}$$

$$= \sqrt{\frac{36+4+1+1+64}{5}}$$

$$= \sqrt{212} = 4.604$$

63 **(b)**

The formula for combined mean is

$$\bar{X} = \frac{n_1\bar{X}_1 + n_2\bar{X}_2}{n_1+n_2}$$

We are given $\bar{X} = 25, \bar{X}_1 = 26, \bar{X}_2 = 21$. Let $n_1 + n_2 = 100$

and $n_1$ denotes men and $n_2$ denotes women

$n_2 = 100 - n_1$

$$\therefore 25 = \frac{26n_1 + 21(100-n_1)}{100} \Rightarrow n_1 = 80$$

So, $n_2 = 20$

Hence, the percentage of men and women is 80 and 20 respectively

64 **(b)**

Taking $X$ as the product of variates $X_1, X_2, \ldots, X_r$ corresponding to $r$ sets of observations i.e. $X = X_1X_2 \ldots X_r$, we have

$$\log X = \log X_1 + \log X_2 + \ldots \log X_r$$

$$\Rightarrow \sum \log X = \sum \log X_1 + \sum \log X_2 + \ldots + \sum \log X_r$$

$$\Rightarrow \frac{1}{n}\sum \log X = \frac{1}{n}\sum \log X_1 + \frac{1}{n}\sum \log X_2 + \ldots + \frac{1}{n}\sum \log X_r$$

$$\Rightarrow \log G = \log G_1 + \log G_2 + \ldots + \log G_r$$

$\Rightarrow G = G_1 G_2 \ldots G_r$

68 **(a)**

For a moderately skewed distribution, we have

Mode $= 3$ Median $-2$ Mean

$\Rightarrow$ Mode $= 3(6) - 2(5) = 8$

69 **(d)**

Let $n_1$ and $n_2$ be the number of observations in two groups having means $\overline{X}_1$ *and* $\overline{X}_2$ respectively

Then, $\overline{X} = \frac{n_1\overline{X}_1 + n_2\overline{X}_2}{n_1 + n_2}$

Now, $\overline{X} - \overline{X}_1 = \frac{n_1\overline{X}_1 + n_2\overline{X}_2}{n_1 + n_2} - \overline{X_1}$

$= n_2\frac{(\overline{X}_2 - \overline{X}_1)}{n_1 + n_2} > 0 \quad (\because \overline{X}_2 > \overline{X}_1)$

$\Rightarrow \overline{X} > \overline{X}_1$ ...(i)

And $\overline{X} - \overline{X}_2 = \frac{n_1(\overline{X}_1 - \overline{X}_2)}{n_1 + n_2} < 0 \quad \because \overline{X}_2 > \overline{X}_2$

$\Rightarrow \overline{X} < \overline{X}_2$ ...(ii)

From relations (i) and (ii), we get

$\overline{X}_1 < \overline{X} < \overline{X}_2$

71 **(b)**

Given lines are $3\overline{x} - 2\overline{y} + 1 = 0 \quad \ldots(i)$

And $2\overline{x} - \overline{y} - 2 = 0 \quad \ldots(ii)$

On solving Eqs. (i)and (ii), we get $\overline{x} = 5, \overline{y} = 8$

72 **(c)**

It is true that mode can be computed from histogram and median is not independent of change of scale.

But variance is independent of change of origin and not of scale.

77 **(c)**

$$r_{xy} = \frac{\sum (x - \overline{x})(y - \overline{y})}{\sqrt{\sum (x - \overline{x})^2 \sum (y - \overline{y})^2}}$$

$$= \frac{20}{\sqrt{36 \times 25}} = \frac{2}{3} = 0.66$$

78 **(c)**

Correlation coefficient,

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{\{n\sum x^2 - (\sum x)^2\}}\sqrt{\{n\sum y^2 - (\sum y)^2\}}}$$

$$= \frac{10(220) - 40 \times 50}{\sqrt{10(200) - (40)^2}\sqrt{10(262) - (50)^2}}$$

$$= \frac{200}{20 \times 10.954} = \frac{200}{219.08} = 0.91$$

79 **(a)**

Let us assume that line of regression y on x +4y =3 and $x$ *on* $y$ *is* $3x + y = 15$.

$\therefore$ *put* $y = 3$ *in* $3x + y = 15$

$\Rightarrow 3x = 15 - 3$

$x = 4$

| ANSWER-KEY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Q. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **A.** | D | A | B | B | D | C | A | A | D | B |
| | | | | | | | | | | |
| Q. | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| **A.** | B | C | C | B | A | B | C | C | A | C |
| | | | | | | | | | | |