DPP

DAILY PRACTICE PROBLEMS

Class : XIth **Solutions** **Subject : MATHS**

Date : **DPP No. :8**

Topic :-STATISTICS

141 **(d)**

Let $x_1,x_2,...,x_n$ be n numbers. Then,

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

If each number is divided by 3, then the new mean $\overline{Y}$ is given by

$$\overline{Y} = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{x_i}{3}\right) = \frac{1}{3}\left(\frac{1}{n}\sum_{i=1}^{n} x_i\right) = \frac{\overline{X}}{3}$$

142 **(c)**

Let $x_1,x_2, x_3,..., x_n$ be the variates corresponding to n sets of data, each having the same number of observations say k and x be their product. Then, $x = x_1, x_2,...,x_n$

$\log x = \log x_1 + \log x_2 + ... + \log x_n$

$\Rightarrow \frac{\sum \log x}{k} = \frac{\sum \log x_1}{k} + \frac{\sum \log x_2}{k} + ... + \frac{\sum \log x_n}{k}$

$\Rightarrow \log G = \log G_1 + \log G_2 + ... + \log G_n$

$\Rightarrow G = G_1 G_2,...,G_n$

143 **(c)**

Let the first natural number be x

According to the question,

$x + x + 1 + x + 2 + x + 3 + x + 4 + x + 5 + x$
$+6 + x + 7 + x + 8 + x + 9 + x + 10 = 2761$

$\Rightarrow 11x + 55 = 2761$

$\Rightarrow x = \frac{2761 - 55}{11} = 246$

$\therefore$ Middle number $= x + 5 = 246 + 5 = 251$

144 **(a)**

We have, $4\overline{x} + 3\overline{y} + 7 = 0$ ...(i)

And $3\overline{x} + 4\overline{y} + 8 = 0$ ....(ii)

On solving Eqs.(i) and (ii), we get

$\overline{x} = -\frac{4}{7}$ *and* $\overline{y} = -\frac{11}{7}$

145 **(b)**

Let the n-numbers be x_1,x_2,...,x_n. Then,

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

$$\Rightarrow \overline{X} = \frac{x_1 + x_2 + \ldots + x_{n-1} + x_n}{n}$$

$$\Rightarrow \overline{X} = \frac{k + x_n}{n} \quad [\because x_1 + x_2 + \ldots x_{n-1} = k]$$

$$\Rightarrow x_n = n\,\overline{X} - k$$

146 **(d)**

7th decile $D_7 = \frac{7n}{10}$ ...(i)

And 7th percentile, $P_{70} = \frac{7n}{100}$ ...(ii)

From Eqs. (i) and (ii), we get

$D_7 \neq P_{70}$

149 **(c)**

Total of corrected observations

$= 4500 - (91 + 13) + (19 + 31)$

$= 4446$

$\therefore$ Mean $= \frac{4446}{100} = 44.46$

150 **(b)**

Given $b_{yx} = 0.8, b_{xy} = 0.2$

Then, $r = \sqrt{b_{xy}b_{yx}} = \sqrt{(0.8)(0.2)} = \sqrt{0.16}$

$\Rightarrow \quad r = 0.4$

152 **(c)**

Regression coefficient of y on x is given by $\frac{cov(x,y)}{\sigma_x^2}$

153 **(a)**

Let numbers of boys are x and numbers of girls are$y$.

$\therefore \quad 53(x + y) = 55y + 50x$

$\Rightarrow \quad 3x = 2y$

$\Rightarrow \quad x = \frac{2y}{3}$

$\therefore$ total number of students $= x + y = \frac{2y}{3} + y = \frac{5}{3}y$

Hence, required percentage

$= \frac{y}{5y/3} \times 100\% = \frac{3}{5} \times 100\% = 60\%$

154 **(b)**

Let $n_1 and$ n_2 be the number of men and women in a group. According to the given condition,

$$\frac{n_1 \times 26 + n_2 \times 21}{n_1 + n_2} = 25$$

$\Rightarrow 26n_1 + 21n_2 = 25n_1 + 25n_2$

$\Rightarrow n_1 = 4n_2 \Rightarrow \frac{n_1}{n_2} = \frac{4}{1}$

$\Rightarrow \frac{n_1}{n_2} = \frac{80}{20}$

158 **(d)**

The intersecting point of two regression lines is on mean ie, $(\overline{x},\overline{y})$.

159 **(b)**

Let the regression coefficients be b_{yx}=-0.33

And $b_{xy} = -1.33$

$\therefore \quad r = -\sqrt{b_{yx} \times b_{xy}}$

$= -\sqrt{0.33 \times 1.33}$

$= -\sqrt{0.4389}$

$= -0.66$

160 **(c)**

Cov $(x,y) = \frac{\Sigma_{xy}}{n} - \frac{\Sigma_x}{n} . \frac{\Sigma_y}{n} = \frac{1}{10}(850) - \left(\frac{30}{10}\right)\left(\frac{400}{10}\right)$

$= 85 - 120 = -35$

And var $(x) = \sigma_x^2 = \frac{1}{n}\Sigma x^2 - \left(\frac{\Sigma_x}{n}\right)^2$

$= \frac{196}{10} - \left(\frac{30}{10}\right)^2 = 10.6$

$\therefore \quad b_{yx} = \frac{cov(x,y)}{var(x)} = \frac{-35}{10.6} = -3.3$

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