Quiz#3 BBA-B Solution

Probability and statitics (National University of Computer and Emerging Sciences)

Business Statistics

Spring 2022

Quiz # 3

Date: 06-04-2022 **Time: 10 minutes**

Name: **Roll no:**

Section: BBA-B

1- Calculate mean deviation and coefficient of mean deviation from mean of the weights of 60 apples.

Weights (grams)	65 - 84	85 - 104	105 - 124	125 - 144	145 - 164	165 - 184	185 - 204
Frequency	09	10	17	10	05	04	05

Weights	f	CB	x	fx	$f\cdot\lvert x-\bar{x}\rvert$
65 – 84	9	64.5 – 84.5	74.5	670.5	432
85 – 104	10	84.5 – 104.5	94.5	945	280
105 – 124	17	104.5 – 124.5	114.5	1946.5	136
125 – 144	10	124.5 – 144.5	134.5	1345	120
145 – 164	5	144.5 – 164.5	154.5	772.5	160
165 – 184	4	164.5 – 184.5	174.5	698	208
185 – 204	5	184.5 – 204.5	194.5	972.5	360
	$\Sigma f = 60$			$\Sigma fx = 7350$	$\Sigma f\cdot\lvert x-\bar{x}\rvert = 1696$

$$\bar{X} = \frac{\Sigma fx}{\Sigma f} = \frac{7350}{60} = 122.5$$

$$MD_{mean} = \frac{\Sigma f\,|X-\bar{X}|}{\Sigma f} = \frac{1696}{60} = 28.27$$

$$COMD_{\bar{X}} = \frac{MD_{mean}}{mean\ (\bar{X})} = \frac{28.27}{122.5} = 0.231$$

2- For a group of 100 candidates the mean and standard deviation of their marks were found to be 60 and 15 respectively. Later, it was found that the scores 45 and 72 were wrongly entered as 40 and 27. Find the correct mean and standard deviation.

$n = 100 \quad \bar{x} = 60 \quad SD = 15$

$\bar{X} = \frac{\Sigma x}{n}$

$\Sigma x = \bar{x} \times n$

$= 60 \times 100$

$= 6000$

$SD = \sqrt{\frac{\Sigma x^2}{n} - \left(\frac{\Sigma x}{n}\right)^2}$

$(15)^2 = \left(\sqrt{\frac{\Sigma x^2}{100} - \left(\frac{6000}{100}\right)^2}\right)^2$

$225 = \frac{\Sigma x^2}{100} - 3600$

$\Sigma x^2 = 382500$

correct total $(\Sigma x) = 6000 - 40 - 27 + 45 + 72$

$= 6050$

correct $\Sigma x^2 = 382500 - 40^2 - 27^2 + 45^2 + 72^2$

$= 387380$

correct mean $(\bar{x}) = \frac{\Sigma x}{n} = \frac{6050}{100}$

$= 60.50$

$SD = \sqrt{\frac{387380}{100} - \left(\frac{6050}{100}\right)^2} = 16.55$

3- If x and y are two independent variables with standard deviation of $\sigma_x = 8$ and $\sigma_y = 16$. Find V (Z) of $Z = 4x - 5y - 30$.

$\sigma_x = 8 \longrightarrow \sigma_x^2 = 64$

$\sigma_y = 16 \longrightarrow \sigma_y^2 = 256$

$Z = 4x - 5y - 30$

$V(Z) = 4^2 V(x) + 5^2 V(y) + 0$

$V(Z) = 16(64) + 25(256)$

$V(Z) = 1024 + 6400$

$V(Z) = 7424$