Answer All Questions   *Time Allowed: Two Hours*

1. The data below are from an experiment with carrots to investigate the effect of sowing rate on yield for two stocks of seed. The experiment consisted of 3 randomized blocks of the 8 treatment combinations.

Stock	Sowing rate (kg/ha)	Block I	Block II	Block III
S_1	1.5	4.20	4.94	4.45
	2.0	4.36	3.50	4.17
	2.5	5.40	4.55	5.75
	3.0	5.15	4.40	3.90
S_2	1.5	2.82	3.14	3.80
	2.0	3.74	4.43	2.92
	2.5	4.82	3.90	4.50
	3.0	4.57	5.32	4.35

a. Calculate the analysis of variance, examining the effects of stock and sowing rate and the interaction between these two factors.

b. Summarize the data in a table of means and report your conclusions.

2. Write Short notes on the followings;

    a. Interaction effects in factorial experiments

    b. Regression and correlation

    c. DMRT

3. The following table gives measurements of 10 onion bulbs with diameters between 5 and 70 mm with their corresponding weights in grams.

Diameter (X)	Weight(Y)
51.0	63.4
66.2	115.3
69.2	146.6
69.5	132.6
56.9	80.7
67.1	125.6
58.1	80.0
53.9	78.7
63.0	112.8
60.0	96.2

$\Sigma X = 614.9$ $\Sigma X^2 = 38192.17$ $\Sigma Y = 1031.9$

$\Sigma Y^2 = 113247.79$ $\Sigma XY = 65014.60$

    a. Draw scatter diagram and fit the regression line.

    b. Calculate the correlation coefficient and comment on the relationship.

    c. Construct ANOVA table and comment on the results.

4. Critically comment on the following statements.

    a. Coefficient of Variation (CV) is considered as a good index of the reliability of the experiment.

    b. Least Significant Difference (LSD) test is not valid for comparing all possible pairs of means when the number of treatments is more.

    c. Uniformity trial data has not been widely used in agricultural research.

    d. Blocking and ANOCOVA cannot be interchangeable.

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