

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL/MAY 2015

(UG—CCSS)

Complementary Course

MB 4C 15—BIOSTATISTICS – II

Time : Three Hours

Maximum : 30 Weightage

Part A

*Answer all questions.
Each question carries a weight of $\frac{1}{4}$.*

1. Type I error stands for :
 - (a) Rejecting H_0 when H_0 is true.
 - (b) Rejecting H_0 when H_0 is False.
 - (c) Accepting H_0 when H_0 is true.
 - (d) Accepting H_0 when H_0 is false.
2. The **performace** of a statistical test depends on :
 - (a) Only significance level.
 - (b) Only the power of the test.
 - (c) Both significance level and power.
 - (d) None of these.
3. The square of the correlation coefficient is called :
 - (a) Coefficient of association.
 - (b) Coefficient of **determination**.
 - (c) Yule's coefficient.
 - (d) Spearman's coefficient.
4. If correlation coefficient $r = \pm 1$ then :
 - (a) Regression lines are perpendicular.
 - (b) There are no regression lines.
 - (c) Regression lines coincide.
 - (d) None of these.
5. The value of correlation coefficient r satisfies :
 - (a) $-1 < r < 1$.
 - (b) $0 < r < 1$.
 - (c) $-1 \leq r \leq 1$.
 - (d) $-1 < r < 1$.

Turn over

6. Rank correlation coefficient equals 1 implies :
- Rankings are not similar.
 - Ranking is not proper.
 - Same ranks are assigned to both sets of scores.
 - None of these.
7. When we conduct a **CRD** where we compare the yields of 3 varieties of paddy, these varieties are called _____
8. To test the significance of a correlation coefficient we use _____ test.
9. In the chi-square test for testing association of 2 attributes the null hypothesis states that the two attributes are _____
10. The two regression lines intersect at _____
11. If there are 30 observations in an **RBD** there the degrees of freedom for the total sum of squares is _____
12. Principle of least squares minimizes _____ sum of squares.

(12 x $\frac{3}{4}$ = 3 weightage)

Part B

*Answer **all** questions.
Each carries a weight of 1.*

- Define analysis of variance.
- What is meant by interaction ?
- What is local control ?
- Define significance level of a test.
- What is a contingency table ?
- Explain the formula for calculating rank correlation coefficient.
- Give the concept of multiple correlation.**
- State the 95% confidence interval for the parameter β in the regression model $y = a + \beta x + u$.**
- Explain why there are two regression lines.**

(9 x 1 = 9 weightage)

Part C

*Answer any **five** questions.
Each carries a weight of 2.*

- 22. Find the rank correlation coefficient given the following ranks for x and y values.**

x	5	4	3	2	1
y	4	5	3	2	1

23. What are the basic principles of experimentation ?
24. Give the layout of an **RBD** design and describe the ANOVA table.
25. In the case of 3 variables x_1, x_2, x_3 based on 25 sets of values we have the following $r_{12} = 0.73$, $r_{13} = 0.68$ and $r_{23} = 0.59$. Find $r_{12.3}$ and $r_{1.23}$.
26. In the regression model $y = a + \beta x + u$ how can we test the hypothesis $\beta = 0$?
27. Find out the correlation coefficient and the regression of y on x given the following information :
- $\bar{x} = 102, \sum y = 96, \sum x^2 = 1368$
 $\sum \hat{y} = 1500, \sum xy = 1366, n = 10.$
28. Complete the following ANOVA table and state which design was used :—

Source	S.S	df	1	M.S.S.	F
Treatments	—	3		—	—
Blocks	183.5	3		—	—
Error	26.0	—		—	
Total	709.0	15			

(5 x 2 = 10 weightage)

Part D

Answer any **two** questions.
 Each question carries a weight of 4.

29. The following are the amounts of corn (bushels per acre) obtained from 4 varieties A, B, C, D.
 Examine whether there is significant difference between the yields of the varieties.

A	2, 1, 3, 2
B	3, 4, 2, 3, 4, 2
C	6, 4, 8
D	7, 6, 7, 4

Turn over

30. From the following data find the correlation coefficient and the regression lines :—

Weight	64	75	73	82	76
Glucose level	108	109	104	102	105

31. In a sample of size 163 the observed distribution of offsprings i

Class	AB	Ab	aB	ab
Frequency	105	25	28	5

Test

(2 x 4 = 8 weightage)