C 41489

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH 2013

(CCSS)

Microbiology

MB4 C15—BIOSTATISTICS—II

Time : Three Hours

Maximum : 30 Weightage

Part A

Answer **all** *questions.*
Each question carries a weight of ¼.

L The hypothesis that is tested for rejection under the assumption that it is true is called :

    (a) Null Hypothesis.

    (b) Alternate hypothesis.

    (c) Testing Hypothesis.

    (d) None of the above.

2. Region of rejection in testing is also known as :

    (a) Sampling region.

    (b) Critical region.

    (c) Selection region.

    (d) All of the above.

3. ———— distribution is used for testing 'Goodness of Fit'.

    (a) Normal.

    (b) t distribution.

    (c) Chi square.

    (d) None of the above.

4. A ———— hypothesis specifies the distribution completely.

    (a) Simple.

    (b) Composite.

    (c) Null.

    (d) Alternate.

5. The range of correlation coefficient is ————

    (a) $0 < r < 1$.

    (b) $\infty < r < 1$.

    (c) $-\infty < r < \infty$.

    (d) $1 < r < 1$.

6. Regression analysis measures ———— between X and Y.

    (a) Average relationship.

    (b) Angle.

    (c) Correlation.

    (d) Linear relationship.

7. Analyse of variance is a statistical technique introduced by ————

    (a) R.A. Fischer.

    (b) W.S. Gosset.

    (c) Neymann.

    (d) Lehmann.

Turn over

8. For conducting an ANOVA all the observation must be ＿ ＿

   (a) Continuous.   (b) Uncorrelated.

   (c) **Non.zero.**   (d) None of these.

9. The correlation between two Independent variables is ＿＿＿＿

10. The formula for finding the partial correlation coefficient $1'_{12.3}$ is ＿ ＿

11. In testing the independent of attributes the null hypothesis is that the attributes are ＿ ＿

12. Testing the presence of correlation is done using ＿＿＿＿ test.

(12 x $\frac{1}{4}$ = 3 **weightage**)

Part B

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

13. What is meant by a 'Statistical test' **?**

14. Define Significance Level and Power of the test.

15. Give any *two* assumptions underlying the test of 'Goodness of Fit'.

16. Explain the concept of ANOVA.

17. Define Spearman's rank correlation coefficient.

18. What is meant by a scatter diagram **?**

19. Write notes on 'Direct' and 'Inverse' correlations.

20. What do you mean by randomization in Experimental designs **?**

21. Describe testing of presence of correlation.

(9 x 1 = 9 **weightage**)

Part C

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

22. Define correlation between two variables. What are its applications **?**

23. What is meant by Linear regression **?** What are the two regression lines **?** Give their equations.

24. Outline the two way ANOVA procedure. Explain the ANOVA table.

25. If σ_x = 6, a$_y$ = 10 and **cov** (x, y) = − 30, find the correlation between X and Y. Comment on the same. Also find the regression coefficients.

26. Give any *two* merits of Rank correlation coefficient. Calculate the Rank correlation coefficient between the Educational status (X) and Age at Marriage (Y)

   Rank of (X, Y) = (1, 5), (2, 4), (4, 1), (5, 3), (3, 2).

27. From the data relating to the yield of bark (X_1), height (X_2) and thickness (X_3) of 18 cinnamon plants, the following yields were obtained $R_{12} = 0.77$, $r_{13} = 0.72$ and $r_{23} = 0.52$. Find the partial correlation coefficient $r_{12.3}$ and multiple correlation coefficient $R_{1.23}$.

28. Explain the statistical test for testing the significance of Regression coefficients. What is the confidence interval in regression ?

(5 x 2 = 10 weightage)

Part D

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

29. Calculate (i) Regression equations ; (ii) Wife's age when husband is 25 and (iii) husband's age when wife is 19 from the given data :

    Age of husband   : 25 30 40 42 50 28 34 27 23 31

    Age of Wife   : 24 26 32 39 46 22 30 23 20 30

30. The following data gives the distribution of digits in numbers chosen from pages of a book. Check whether they can be assumed to occur with equal frequency in the pages ?

Digits	0	1	2	3	4	5	6	7	8	9	Total
Frequency :	1026	1107	997	966	1073	933	1107	972	964	853	10000

31. Three drugs A B and C are given to 4 patients and their increase in Hemoglobin level is given below. Analyze the data and test whether all three drugs are equally effective.

A		8	4	6	7
B	...	7	·5	5	3
C		2	5	5	4

(2 x 4 = 8 weightage)