LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**

THIRD SEMESTER – APRIL 2017

ST 3203- BIOSTATISTICS

Date: 04-05-2017   Dept. No.   Max. : 100 Marks
09:00-12:00

SECTION - A

Answer all the questions   (10x2=20 Marks)

1. Provide any two applications of Biostatistics
2. Define random experiemnt and give an example
3. Define Conditional probability
4. Define simple linear regression model
5. State any two difference between correlation and regression
6. Define Statistical Hypothesis
7. State any one method to test for Normality
8. State the assumptions of one way ANOVA
9. Define interaction effect
10. Define Spearman's Rank Correlation

SECTION-B

Answer any five questions   (5x8=40 Marks)

11. Explain Nominal, Ordinal, Interval and Ration type variables

12. State the hypothesis and the steps involved in chi-square test of independence

13. Yield were observed under two different fertilizers

    Fertilzer A: 33,22,26,28,29,14,21,26,24,32,

    Fertilizer B: 22,26,24,28,19,21,16,21,27,11,

    Use two independent sample t tet and test whether the mean yield is the same ?

14. Determine Karl Pearson coefficient of correlation for the following data

Dosage	13	17	16	18	19	20	21	26	24	29
Reproduction	35	34	46	56	67	76	89	67	98	103

15. The length of a species is assumed to follow normal distribution with mean 40cms and standard deviation 4cm. i) What is the probability of the length to be less than 30cm   ii) What is the probability that the length is greater than 60cm

16. Two batches of 50 animals were treated and other not treated were suffering from infection of a disease. The following frequency was observed. Use Chi-square test of independence and conclude whether the treatment be regarded as effective against the disease?

	Dead	Surviving
Treated	29	21
Not Treated	38	12

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17. .Data on months taken to relapse of a certain disease under two different drug is given

Drug I	4	4.5	5.5	0.8	5.5	3.5
Drug II	10	11	12	8	4.5	9

Test whether the two treatment procedures are the same using Mann-Witney U test

18. Provide the Null hypothesis and Test Statistic for the following testing procedures

 i. Two Independent sample t test

 ii. Paired t test

 iii. Wilcoxon Singned rank test

 iv. Mann Whitney Wilcoxon test

SECTION-C

 Answer any TWO questions   **(2X20=40 Marks)**

19. i) State and prove additiona theorem of probability (6 Marks)

 ii) State and prove Multiplication theorem of probability (6 Marks)

 iii) State and prove Bayes theorem (8 Marks)

20. Three different drugs were tested for curing a certain disease and the days taken to cure are given below. Construct a one way ANOVA and test whether there is significant difference between the treatments and provide your conclusion

Drug A	12	16	19	18	19	14
Drug B	24	35	46	67	76	59
Drug C	27	49	67	49	68	97

21. Construct regression model of calcium level on bone density

Clacium (X)	124	164	189	198	214	218
Bone Density(Y)	232	326	489	679	798	749

22.   i) Explain the steps involved in Mann Whitney U test (6 Marks)

 ii) Three treatments were tested for reduction in growth of cancer cell. Compare the

effectiveness of the treatments using Kruskal-Wallis test   (14 Marks)

Treatment A	15.1	11.9	13.5	12.6	16.8
Treatment B	14.5	15	11.3	12.3	9.7
Treatment C	13.2	11.8	10.5	9.3	9.9

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