LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **STATISTICS**

FIFTH SEMESTER – **NOVEMBER 2018**

16UST5ES02 – BIO-STATISTICS AND SURVIVAL ANALYSIS

Date: 03-11-2018 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART-A

Answer ALL the questions **10X2=20 Marks**

1. What is Survival Data Analysis ?
2. What is Experimental Study ?
3. Define Survival Function S(t)
4. What is the need for Non-parametric test procedures?
5. Define Prevalence with an example
6. What is censored data in survival analysis?
7. Provide the table layout of one way ANOVA test procedure
8. What is the use of Kappa Statistic?
9. What is Odds ratio ?
10. Provide density function and survival function of Weibull distribution

PART-B

Answer any FIVE questions **5x8=40 Marks**

11. Explain Cross-sectional study and Cohort Study designs with example
12. Discuss any four applications of Biostatistics
13. Explain Type I, Type II and Type III censoring in Survival analysis
14. i) Discuss Germ Theory of Disease
    ii) Discuss the contribution of Louis Pasteur in the field of Drug discovery

15. A random sample of 10 Coronary Heart Disease patient's heart rate was measured before and after taking a cup of caffeinated coffee. The results were beats/min. Assuming the difference in heart rate before and after taking a cup of caffeinated coffee follows a normal distribution, does caffeinated coffee have any effect on the heart rate of CHD patients?

Patient ID	1	2	3	4	5	6	7	8	9	10
Without Intake	68	64	52	76	78	62	66	76	78	60
With Intake	74	68	60	72	76	68	72	76	80	64

16. i) Discuss f(t), S(t) and h(t) for Exponential Distribution
    ii) Consider the following remission times in weeks for 21 patients with acute leukemia: 1, 1, 2, 2, 3, 4, 4, 5, 5, 6, 8, 8, 9, 10, 10, 12, 14, 16, 20, 24, and 34. Assume that remission duration follows the exponential distribution. Obtain 95% confidence interval for λ
17. Discuss the different phases on clinical trials
18. Explain McNemar test with an example

PART-C

Answer any TWO questions **2x20=40 Marks**

19. Explain in detail the contributions of Edward Jenner, Ronald Ross , Alexander Fleming and Jonas Salk
20. i. What is meant by Protocol in Clinical trials?
    ii. What are the questions answered by a Clinical trial protocol?
    iii. What are the qualities of a Good Protocol?
    iv. Discuss Patient selection in a Clinical trial
    v. Discuss the table of contents of a Clinical Trial Protocol
21. Compare the Survival curves for the two treatment procedures using Kaplan-Meier method
    Trt A: 1, 2, 2, 2, 6, 8, 8, 9, 13, 16, 17, 29, 34, 2+, 9+, 13+, 22+, 25+, 36+, 43+, 45+
    Trt B: 1, 2, 5, 7, 12, 42, 46, 54, 7+, 11+, 19+ 22+, 30+, 35+
22. Test the difference in Survival curves using Log Rank test between the two treatment procedures for the data given below
    Trt A: 1, 2, 2, 2, 6, 8, 8, 9, 13, 16, 17, 29, 34, 2+, 9+, 13+, 22+, 25+, 36+, 43+, 45+
    Trt B: 1, 2, 5, 7, 12, 42, 46, 54, 7+, 11+, 19+ 22+, 30+, 35+

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