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Register no :

Date :7-03-2022

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**

**M.Sc. BIOTECHNOLOGY- I SEM**

**END SEMESTER EXAMINATION: October 2021**

(Exams conducted during March 2022)

**BT 7421:** **Biostatistics**

**Time: 2.5 Hrs Max Marks: 70**

**Note The question paper has THREE parts and THREE printed pages**

1. **Answer any Ten of the following 10x2=20 marks**
2. Define Range ?
3. State any two characters of ideal measures of central tendency?
4. Explain mutually exclusive events with example?
5. In an amusement fair, a competitor is entitled for a prize if he throws a ring on a peg from a certain distance. It is observed that only 30% of the competitors can do this. If someone is given 5 chances, what is the probability of his winning the prize when he has already missed 4 chances?
6. Define positive and negative correlation?
7. Define correlation and regression analysis?
8. What is cluster sampling? When is it useful?
9. What is type II error?
10. What is meant by randomization? When is it useful?
11. What is Degrees of Freedom?
12. What is Least significant difference? How do you compute it?
13. State the difference between sample statistic and population parameters.
14. **Answer any Five of the following 5x6=30 marks**
15. For a distribution Karl Pearson’s coefficient of skewness is 0.64, standard deviation is 13 and mean is 59.2 Find mode and median.
16. The following results were obtained from measurements of body weight (x) in gm and brain ACHE activity (y) of 25 tilapia fish. ∑x= 97.4, ∑y=124.5, ∑x2= 459.80, ∑y2=643.81, ∑xy=444.68. Find out appropriate equation and establish brain ACHE activity. of a fish having a body weight of 5g.
17. Compute the median of the following frequency distribution of blood sugar scores of a sample of goats.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Class Interval | 61-65 | 66-70 | 71-75 | 76-80 | 81-85 |
| Frequency (f) | 12 | 25 | 45 | 30 | 8 |

1. While studying the toxic effect of pesticide Dimecron-100 on fish *Tilapia*, the probability of their survival was found to be 20%. If 30 batches of 6 fish each are subjected to such experiment in how many batches four or more fish will die?
2. The following data pertains to the effect of Aminophylline Treatment 24 hours prior and 16 hours after treatment. Is the drug effective?

|  |  |  |  |
| --- | --- | --- | --- |
| **Patient** | **Before Treatment** | **After Treatment** | **Difference** |
| 1 | 1.71 | 0.13 | 1.58 |
| 2 | 1.25 | 0.88 | 0.37 |
| 3 | 2.13 | 1.38 | 0.75 |
| 4 | 1.29 | 0.13 | 1.16 |
| 5 | 1.58 | 0.25 | 1.33 |
| 6 | 4.00 | 2.63 | 1.37 |
| 7 | 1.42 | 1.38 | 0.04 |
| 8 | 1.08 | 0.50 | 0.58 |
| 9 | 1.83 | 1.25 | 0.58 |
| 10 | 0.67 | 0.75 | -0.08 |
| 11 | 1.13 | 0.00 | 1.13 |
| 12 | 2.71 | 2.38 | 0.33 |
| 13 | 1.96 | 1.13 | 0.83 |
| Total | 22.76 | 12.79 | 9.97 |
| Mean | 1.751 | 0.984 | 0.767 |
| Variance | 0.7316 | 0.6941 | 0.2747 |

1. The following data explores the possible risk on maternal smoking on perinatal death (foetal and neonatal deaths). Analyze and state your inference.

|  |  |
| --- | --- |
| **Maternal Deaths** | **Perinatal deaths** |
| **Yes** | **No** |
| **Yes** | 619 | 20443 |
| **No** | 634 | 26682 |

1. Conduct a Tukey’s test for the following data and give your inference. (EMSS= 2.51)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A | 8 | 6 | 5 | 8 | 3 | 7 |
| B | 4 | 7 | 4 | 7 | 5 | 7 |
| C | 3 | 3 | 1 | 3 | 4 | 1 |

1. **Answer the following. 2x10=20 marks**
2. a. The following data regarding the ages of husband (x) and ages of wives (y) are given.

∑x= 203, ∑y=178, ∑x2= 5963, ∑y2=4648, ∑xy=5254; n=7. Find out the correlation coefficient between the ages of husbands and wives and write down the two regression lines

 **OR**

 b. Explain the concept of kurtosis

21. a. The following data pertains to ages (months) of infants taken to first walk alone in a completely randomized design. Analyze and state your inference.

|  |  |  |  |
| --- | --- | --- | --- |
| Active Group | Passive Group | No-exercise group | 8-week control group |
| 9.00 | 11.00 | 11.50 | 13.25 |
| 9.50 | 10.00 | 12.00 | 11.50 |
| 9.75 | 10.00 | 9.00 | 12.00 |
| 10.00 | 11.75 | 11.50 | 13.50 |
| 13.00 | 10.50 | 13.25 | 11.50 |
| 9.50 | 15.00 | 13.00 | 12.50 |

 **OR**

b. The following data pertains to the IQ of children with PKU and normal children. Assuming independence of samples, analyze the data and state your inference.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IQ-PKU | 89 | 98 | 116 | 67 | 128 | 81 | 96 | 116 | 110 | 90 | 76 | 71 | 100 | 108 | 74 |
| IQ-Normal | 77 | 110 | 94 | 91 | 122 | 94 | 121 | 114 | 88 | 91 | 99 | 93 | 104 | 102 | 82 |