# T. Y. B. SC. (BIOTECHNOLOGY) SEM – V (CBCS - 2015 COURSE) : SUMMER - 2018

## SUBJECT : BIOSTATISTICS

Day: **Monday**
Date: **02/04/2018**

Time: **10.00 am to 01.00 pm**
Max. Marks: 60

**S-2018-1058**

**N.B.:**

1) Question **No. 1** and Question **No. 5** are **COMPULSORY**. Out of the remaining attempt **ANY TWO** from each section.
2) Both the sections should be solved in **SEPARATE** answer books.
3) Use of programmable **CALCULATOR** is allowed.
4) Figures to the right indicate **FULL** marks.

## SECTION – I

**Q.1** Answer the following: **(10)**

**a)** Given A= {a, b, c, d, e, f } B= {c, e, x, y }
Find $A' \cap B$ and $A \cup B$.

**b)** State the formula for standard deviation.

**c)** In a paired t-test, mean ($d_i$) = 3.2 and standard error ($d_i$) = 0.4. What is the computed value of t-statistic?

**d)** If Covariance (x,y) = -3.5, Variance (x)= 4, Variance (y)=25. Find correlation coefficient.

**e)** Mr. X sleeps in a day for 8 hours, works for 8 hours, and spends rest of the time on personal chores. Draw a pie-diagram to show the distribution.

**Q.2** Answer the following: **(10)**

**a)** Find the mean and standard deviation.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.3 | 3.3 | 4.3 | 5.5 | 6.7 | 8.9 | 10 | 2.2 | 3.3 | 4.3 |
| 6.7 | 8.9 | 10 | 11.2 | 11.2 | 3.3 | 10 | 4.3 | 5.5 | 6.7 |

**b)** Fruits were classified as under when consignment was received.

| | **Large** | **Medium** | **Small** |
|---|---|---|---|
| **Hard** | 15 | 35 | 5 |
| **Soft** | 20 | 20 | 5 |

Use the information to find all marginal probabilities and conditional probabilities.

**Q.3** What is scatter diagram? Explain how to get the exponential, power-law and linear fits to a set of paired observations (x,y) using the ADD TRENDLINE tool, on a spread sheet. **(10)**

**OR**

Explain the applications of Binomial distribution and Normal distribution in biology.

**Q.4** Write short notes on: **(10)**

**a)** Karl Pearson's coefficient of correlation.

**b)** Z distribution.

**P.T.O.**

## SECTION - II

**Q.5** Answer the following: **(10)**

**a)** Complete ANOVA table. Given that there are 5 treatments, 3 replications per treatment, Total SS = 45.6, Treat SS = 32.3. Use F-table = 3.05.

**b)** Find correlation for the following data:

| | | | | | |
|---|---|---|---|---|---|
| X | 15 | 18 | 22 | 17 | 12 |
| Y | 20 | 15 | 20 | 15 | 10 |

**Q.6** Answer the following: **(10)**

**a)** Define rank correlation. Give an illustration of its use.

**b)** Define a random variable and its expected value.

**Q.7** Answer the following: **(10)**

**a)** Why we need to give Data-Names to selected data ranges on a spread sheet. Discuss the process of naming and how to use the named data in functions.

**b)** Discuss how to prepare simple Quality control charts on spread sheet.

**Q.8** Discuss the objectives and steps in computation of Chi-Square test. **(10)**

OR

Discuss the objectives and steps in computation of Multiple linear regressions.

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