

**M. SC. (BIOTECHNOLOGY) SEM-IV (2012 COURSE)(CHOICE
BASED CREDIT SYSTEM) : SUMMER - 2018
SUBJECT : BIOSTATISTICS**

Day : **Thursday**
Date : **12/04/2018**

Time : **02.00 PM TO 05.00 PM**
Max. Marks : 60

S-2018-1094

N.B.:

- 1) **Q.No.1 and Q.No.5 are COMPULSORY.** Out of the remaining questions attempt **ANY TWO** questions from each section.
- 2) Answers to both the sections should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 Compute the following VALUES: **[10]**

- a) In an experiment 320 plants, were examined, out of which 48 were virus-affected. If I pick up a plant at random what is the probability that plant would be healthy?
- b) In the sequence AGGCCCTTAACCG what is the probability of {G or T}?
- c) What is the relative frequency of G in the following data set?
DATA = {A, G, G, G, C, T, T, T, A, A, G, C, C, T, }
- d) If value of Standard Deviation is 4, what is the value of variance?
- e) If a variable is Binomially distributed with $p = 0.5$ and $N = 3$, what is the value of $P(\text{success} = 2)$?

Q.2 a) Identify continuous variable, nominal variable and ordinal variable from the following list. **[01]**

- i) Plant Height in CM
- ii) Soil type as Red, Loamy and Clay
- iii) Severity of Insect Attack specified as strong, moderate and low

b) Find mean, mode and median of drymatter. Observations (gm / plant) are as under: **[06]**

4.0	4.0	4.2	4.1	4.5	4.0	4.0	3.9	4.1	.2
4.4	.3	4.2	4.3	4.2	4.2	4.3	4.2	.0	4.4

c) Draw a histogram of data in (B) above. **[03]**

Q.3 What are the different ways of sampling? Describe at least one method in detail considering a specific case or instance for illustrations. **[10]**

Q.4 a) Explain the terms: simple correlation, rank correlation, genotypic correlation and partial correlation. **[04]**

- b) Use the following information to find the simple correlation coefficient, slope and the intercept: **[06]**
Mean (X) = 2.24, Mean (Y) = 4.86, Var (X) = 4.0, Var (Y) = 9.0,
Cov (X, Y) = 4.0

P.T.O.

SECTION – II

Q.5 With the help of scatter diagrams and straight line fits and nonlinear curves, [10]
indicate following situations:

- a) Positively correlated
- b) Negatively correlated
- c) Uncorrelated
- d) A growth curve
- e) Exponential relation between y and x.

Q.6 Complete the following sentences and rewrite: [10]

- a) If Max = 40, and range is 23, value of Min is _____.
- b) Value of correlation coefficient can never be greater than _____.
- c) If value of standard deviation = 12, $n = 9$, value of standard error is _____.
- d) If Mean Y = 5, slope = 1.0, Mean X = 2.0, value of intercept is _____.
- e) If $\text{Cov}(X, Y) = 3.4$ and $\text{Var}(X) = 1.7$, value of slope = _____.
- f) Mean of a binomial distribution is _____, if $n = 35$ and $p = 0.2$.
- g) If a variable is normally distributed then percentage of observations included in the interval (Mean – S.D., Mean + S.D.) are _____.
- h) The most common value of level of significance used in testing of hypothesis is _____.
- i) Value of statistic R-square is always less than or equal to _____.
- j) Conditional probability $P(A|B)$ is defined as _____.

Q.7 a) What do you understand by testing of Hypothesis? Explain the process in [05]
general.

b) State the properties of Gaussian distribution. [05]

Q.8 In laboratory trial, Total Soluble Solids of 4 beverages were determined, with [10]
6 replications each. Total sum of squares was 34.5 and product sum of squares was 23.2. Prepare appropriate ANOVA table and compute the relevant F-statistic. Write your inference to the extent possible, on the basis of the values you see in the ANOVA table.

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