M. SC. (BIOTECHNOLOGY) SEM-IV (2012 COURSE)(CHOICE BASED CREDIT SYSTEM) : WINTER - 2017

SUBJECT : BIOSTATISTICS

Day : **Thursday**
Date : **02/11/2017**

W-2017-0979

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

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 **a)** Give practical examples two continuous variable, two nominal variables and two ordinal variables from the biotech domain. **[02]**

b) Find mean, mode and median of plant height. Observations (plant height cm) are as under : **[05]**

30	30	32	31	35	30	30	29	31	32
34	33	32	33	32	32	33	32	30	34

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

Q.2 Explain the following concepts in brief: **[10]**

a) Pie chart **c)** Range **e)** Sample
b) Level of significance **d)** Scatter diagram

Q.3 **a)** List and describe the common measures of dispersion (at least 5). **[05]**
b) State the properties of Normal (Gaussian) distribution. **[05]**

Q.4 In each of the following cases. Use the given information to find the simple correlation coefficient, slope and the intercept: **[10]**

Case 1	Mean (X) = 3.24	Mean (Y) = 4.56	Var (X) = 4.0	Var (Y) = 9.0	Cov (X,Y) = 5.0
Case 2	Mean (X) = 1.23	Mean (Y) = 12.0	Var (X) = 2.5	Var (Y) = 1.6	Cov (X,Y) = –0.2

What is the major difference between the natures of the regression equations in the two cases?

SECTION – II

Q.5 Use the following data to test the hypothesis that the two sample mean are same, using t-test (independent samples). **[10]**

	n	Mean	Variance
Sample 1	18	3.2	2.34
Sample 2	22	4.3	2.54

t-value for 38 df = 1.96, assume alpha = 0.05.

P.T.O.

Q.6 A crop performance trial was conducted with 4 varieties. Soil being homogeneous, 6 replications each were used, so that total plots were 24. Crop yield was the variate. Total sum of squares was 34.5, and varietal 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. **[10]**

Q.7 Complete the following sentences and rewrite: **[10]**

a) If Max = 36,a nd range is 23, value of Min is _____.

b) Value of correlation coefficient can never be greater than _____.

c) If value of standard deviation = 25, n = 16, value of standard error is _____.

d) If Mean Y = 5, slope = 1.0, Mean X = 2.0, value of intercept is _____.

e) If Cov (X, Y) = 3.4 and 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.8 Compute the following VALUES: **[10]**

a) In an eye camp 320 patients were treated. 40% of them were females. What is the probability that a patient randomly picked is male?

b) In the sequence AGGCCCTTAACCG what is the probability of {G or A}?

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, T}

d) If Variance = 25 and n = 16, what is the value of Standard Error?

e) If in a data set Quartiles are {3.0, 6.7 and 7.5} what is the value of median?

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