KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food.Engg) 2013 Admission
Vth Semester Final Examination-January -2016

Cat. No: Basc 3110 **Marks: 50.00**
Title: Statistics (1+1) **Time: 2 hours**

Section A

Answer all questions.
Each question carries **1** *mark.*

Fill in the blanks with suitable word(s) or phrase(s)

I. 1. In a symmetrical distribution, the coefficient of skewness is _____.
2. If A and B are mutually exclusive events, $P(A \cap B)$ = _____.
3. If in a series the coefficient of variation is 20 and mean 40, the standard deviation shall be _____.
4. The number of times a treatment is repeated in an experiment is called its _____.
5. If $\bar{X}$-chart reveals that the process is under control, there is no need of preparing _____.

State whether the following statements are ***True*** *or* ***False***

6. The value of median and mode can be determined graphically.
7. Correlation always signifies a cause and effect relationship between the variables.
8. A normal curve is completely defined by the mean and the standard deviation.
9. χ^2 test is a nonparametric test.
10. Regression analysis reveals average relationship between two variables.

(10 × 1 = 10 marks)

Section B

Write short notes on ***ANY FIVE*** *of the following questions.*
Each question carries **2** *marks.*

II. 1. Compare the median and mode as measures of location of distribution.
2. Distinguish between population and sample.
3. State the addition theorem of probability for two events: (a) When they are mutually exclusive, and (b) When they are not mutually exclusive.
4. Define Binomial distribution and obtain its mean.
5. Explain the Type I and Type II errors associated with testing of hypothesis.
6. Describe Student's t-test.
7. What is Randomized Block Design?

(5 × 2 = 10 marks)

Section C

Write short essays on ***ANY FIVE*** *of the following questions.*
Each question carries **4** *marks.*

III. 1. Distinguish between $\bar{X}$-chart and np-chart.

2. Explain what do meant by correlation between two variables. What are the methods to of finding the existence of correlation? How can it be measured?
3. What do you understand by skewness and kurtosis? Point out their role in analyzing frequency distribution.
4. Explain non linear regression.
5. When do you use paired *t*-test and how to apply it?
6. A sample of 400 items from a population whose standard deviation is 1.5. The mean of the sample is 2.5. Test whether the sample has come from a population with mean 26.8 at 95% level of confidence.
7. State and prove the multiplication theorem of probability.

(5 × 4 = 20 marks)

Section D

*Write an essay on **ANY ONE** of the following questions.*

IV. 1. (a) Calculate the mean and median for the following distribution given the age of 50 children:

Age in years	0 – 4	4 – 8	8 – 12	12 - 16	16 - 20
No. of children	8	10	20	7	5

(b) The data on sales and promotion expenditure on a product for 10 years are given below.

Sales (Lakhs)	8	10	9	12	10	11	12	13	14	15
Promotion Exp.	2	2	3	4	5	5	5	6	7	5

Use a two variable regression model to estimate the promotion expenditure for a given sale of Rs. 20 lakhs.

2. (a) In an examination in Psychology, 12 students in one class had a mean grade of 78 with a standard deviation of 6, while 15 students in another class had a mean grade of 74 with a standard deviation of 8. Is there a significant difference between the means of the two groups?

(b) An automobile manufacturing company in bringing out a new car model. The company is interested to know whether the model will appeal most to a particular age group or equally to all age groups. The company takes a random sample from persons attending a demonstration show of the new model and obtained the following information:

Person who	Age Group			
	Under 20	20 – 39	40 – 59	60 and above
Liked the car	146	78	41	28
Disliked the car	54	52	32	62

What conclusions can be drawn from the above data at 5% significant level.

(1× 10 = 10 marks)