Roll No..... 14116

BBA/M -14
BUSINESS STATISTICS—II
Paper: BI3A-210

Reappear: 90

Time : Three Hours] [May Marks:

Regular:80

Note: Attempt five questions including Question No. 1 which is compulsory.

1. Compulsory Question

(a) How Correlation analysis is similar to and different from Regression analysis?

(b) List down the properties of Correlation coefficient.

(c) What can you say about the angle between the regression lines when (i) r = 0, (ii) r = 1 and (iii) r increases from 0 to 1? r is the coefficient of correlation between the two variables.

(d) State and develop the multiplication theorem of probability for dependent events.

(e) A problem in mathematics is given to three students A, B and C. Their chances of solving it are 1/2, 1/3, and 1/5 respectively. Find the probability that the problem will be solved.

(f) Explain the meaning of Level of significance in hypothesis testing. 16

2. (a) What is Scatter diagram ? How does it help in studying correlation between two variables, in respect to both its nature and extent?

(b) Calculate the Karl Pearson's Coefficient of correlation between expenditure on advertising (X) and sales (Y) from the data given below :

X:	39	65	62	90	82	75	25	98
Y :	47	53	58	86	62	68	60	91

8+8

3. (a) What is meant by 'Regression' ? Why should there be in general, two lines of regression for each bivariate distribution ?

(b) If the two lines of regression between two variables are expressed as
$4X - 5Y + 30 = 0$ and $20X - 9Y - 107 = 0$,
which of these is the line of regression of X on Y ? Find r_{xy} and S_y when $S_x = 3$.

6+10

4. What are the different approaches to the definition of probability? Explain. Are these approaches contradictory to one another? 16

5. (a) Define Probability. How probability is relevant to decision -making under

uncertainty?

(b) A factory has three units A, B, and C. Unit A produces 50% of its products, and units B and C each produces 25% of the products. The percentage of defective items produced by A, B, and C units are 3%, 2% and 1% respectively. If an item selected at random from the total production of the factory is found defective, what is the probability that it is produced by (i) Unit A, (ii) Unit B and (iii) Unit C?
8+8

6. (a) Explain the purpose of Time series analysis. Explain the different components of a Time series.

(b) Explain the additive and multiplicative models of time series analysis. 8+8

7. (a) What is a Hypothesis? What steps are involved in statistical testing of a hypothesis?

(b) An automatic bottling machine fills oil into 2 –litre (2,000 cm 3) bottles. A consumer advocate wants to test the null hypothesis that the average amount filled by the machine into a bottle is at least 2,000 cm 3 . A random sample of 40 bottles coming out of the machine was selected and the exact contents of the selected bottles are recorded. The sample mean was 1,999.6 cm 3. The population standard deviation is known from past experience to be 1.30 cm 3. Test the null hypothesis at an a of 5%. 8+8

8. Explain the following:

(a) Spearman's Rank Correlation Coefficient.

(b) Coefficient of Determination.

(c) Parametric tests and Non -Parametric tests.

(d) Type -I and Type -II Errors in Hypotheses Testing. 16