Paper Code: RMB-104 **Roll No.** | | | | | | | | | | |

M.B.A.
FIRST SEMESTER EXAMINATION, 2016-17
BUSINESS STATISTICS

[Time: 3 hrs.] [Max. Marks: 70]

Note: Attempt all questions. All questions carry equal marks.

1. Attempt any four parts of the following:- **[3.5×4=14]**

(a) Explain how measures of central tendencies and measures of dispersion complement each other in describing mass data.
(b) What is Coefficient of Variation? What purpose does it serve? Also distinguish between variance and coefficient of variation.
(c) What is Spearman's Rank Correlation Coefficient? Explain its usefulness and how does it differ from Karl Pearson's coefficient of correlation.
(d) What is index number? Describe briefly its application in business and industry.
(e) What is Chi-square test? Under what conditions it is applicable? Briefly explain the underlying assumption.

2. Attempt any two parts of the following:- **[7×2=14]**

(a) Calculate mean, mode, median and first and third quartiles of the weights of 150 students from the data given below:

Weight (in Kg.):	30-40	40-50	50-60	60-70	70-80	80-90
Frequency :	18	37	45	27	15	8

(b) Calculate Karl Pearson's coefficient of skewness from the following:

Class:	0-10	10-20	20-30	30-40	40-50	50-60	6-70	70-80
Frequency:	11	22	30	35	21	11	6	5

(c) What do you understand by dispersion? Discuss the relative merits and demerits of various measures of dispersion.

3. Attempt any two parts of the following:- **[7×2=14]**

(a) What is Regression? Point out its usefulness in business and industry. Also differentiate between correlation and regression with suitable examples.

(b) Find the correlation coefficient between age and sum assured from the following data:

Age Group	Sum Assured (in Rs.)				
	10,000	20,000	30,000	40,000	50,000
20-30	4	6	3	7	1
30-40	2	8	15	7	1
40-50	3	9	12	6	2
50-60	8	4	2	-	-

(c) The following data relate to advertising expenditure (in lakhs of Rs.) and their corresponding sales (in crores of Rs.)

Advertisement (X):	10	12	15	23	20
Sales (Y):	14	17	23	25	21

Estimate: (i) Regression equation of Y on X
(ii) Correlation coefficient (r)
(iii) Sales corresponding to the advertisement expenditure of Rs. 30 lakhs

4. Attempt any two parts of the following:- **[7×2=14]**

(a) Define Binomial and Normal distribution and also discuss the main characteristics of these distributions.

(b) What is index number? Describe briefly its application in business and industry. Also explain the following terms in the study of time series:
(i) Secular trend
(ii) Seasonal trend
(iii) Cyclic trend

(c) Construct index number of price from the following data by applying
(i) Laspeyer's method
(ii) Paasche method
(iii) Bowley's method
(iv) Fisher's method
(v) Marshall-Edgeworth method

	1987		1988	
Commodity	Price	Quantity	Price	Quantity
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

5. Attempt any two parts of the following:- **[7×2=20]**

(a) What is hypothesis? Differentiate between null and alternate hypothesis and also explain various steps involved in testing of a hypothesis.

(b) (i) It is given that in two towns the number of rainy days in a year is 20 and 30 respectively. What is the probability that on a particular day in that year, there is -
Rain in both the towns
- No rain in both towns
- Rain in at least one town

(ii) The following table gives the number of good and bad parts produced by each of three shifts in a factory:

Shift	Good	Bad	Total
Day	900	130	1030
Evening	700	170	870
Night	400	200	600
Total	2000	500	2500

Is there any association between the shift and the uality of parts produced? ($\chi^2 = 5.991$ for d.f. 2)

(c) (i) Two types of new cars produced in India are tested for petrol mileage. One group consisting of 36 cars averaged 24 miles per gallon of petrol while the other group consisting of 72 cars averaged 22.5 mile per gallon of petrol. Test the hypothesis that there exists a significant difference in the petrol consumption of these two types of cars if $\sigma_1^2 = 1.5$ & $\sigma_2^2 = 2.0$ (use $\alpha=0.05$).

(ii) From a pack of cards if a card is drawn what is the probability that the card will be either an ace or a spade.