



CBCS SCHEME

20MBA14

--	--	--	--	--	--	--	--	--	--

First Semester MBA Degree Examination, June/July 2024 Business Statistics

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FOUR full questions from Q1 to Q7.

2. Question No.8 is compulsory.

3. Use of standard normal tables, t-distribution, critical values of F-distribution tables is permitted.

- 1 a. Find the average rate of increase in population which in the first decade has increased by 20%, in the second decade by 30% and in the third decade by 40%. (03 Marks)
- b. Measure the 3rd quartile, 2nd decile and 95th percentile for the following data:

Marks	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69
Frequency	12	27	34	41	23	3

(07 Marks)

- c. The weekly sales of products A and B are recorded in the following table. Examine which one shows greater fluctuation in sales.

Product A	59	75	27	63	27	28	56
Product B	150	200	125	310	330	250	225

(10 Marks)

- 2 a. Mention any three properties of Arithmetic mean. (03 Marks)
- b. Explain Pictorially scatter diagram and how is it used in predictions? (07 Marks)
- c. The following data relate to age of employees and the number of days they reported sick in a month. Calculate Karl Pearson's co-efficient of correlation and interpret it.

Age (years)	30	32	35	40	48	50	52	55	57	61
Sick days	1	0	2	5	2	4	6	5	7	8

(10 Marks)

- 3 a. Determine the two regression coefficients when $r = 0.8$, $\sigma_x = 5$ and $\sigma_y = 7$. (03 Marks)
- b. The average percentage of failures in a certain examination is 40. What is the probability that out of a group of 6 candidates, at least 4 passed in the examination. What is the probability that at the most 2 passed. (07 Marks)
- c. In an intelligence test administered to 500 students and data is normally distributed. The average score was 42 and standard deviation was 24. Find (i) The number of students whose score exceeded 50. (ii) The number of students who scored between 30 and 40. (iii) The number of students who scored above 60. (10 Marks)

- 4 a. Explain the uses of time series analysis. (03 Marks)
- b. The sales of lathes in the last 3 years is given below. Use the method of simple averages to determine seasonal index of each month.

Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2009	16	17	19	19	24	24	21	29	30	34	34	39
2010	22	21	27	26	30	27	21	27	31	36	33	43
2011	28	28	38	39	39	33	33	37	41	50	44	56

(07 Marks)

- c. If two large populations, there are 30% and 25% respectively of fair haired people. Is the difference likely to be hidden in samples of 1200 and 900 respectively from the two populations? (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

- 5 a. Write the objectives of studying time series analysis and variations in time series. (03 Marks)
 b. A sample of size 10 was taken from a population standard deviation of sample is 0.03. Find the maximum error with 99% confidence. (07 Marks)
 c. The quarterly sales for 5 years from 2008-2011 is given below. Use ratio to moving average method to determine seasonal indexes:

Quarter	Sales in Rs. (Thousands)			
	I	II	III	IV
2008	77	62	56	61
2009	85	64	62	79
2010	91	73	67	86
2011	102	80	74	95

(10 Marks)

- 6 a. Compare Type I error and Type II error. (03 Marks)
 b. Explain ANOVA, K-W test and Mann-Whitney test. (07 Marks)
 c. A systematic sample of 100 pages was taken from the concise Oxford Dictionary and the observed frequency distribution of foreign words per page was found to be as follows :

Number of foreign words per page (X)	0	1	2	3	4	5	6
Frequency (f)	48	27	12	7	4	1	1

Calculate the expected frequencies using Poisson distribution. Also compute the mean and variance of fitted distribution. (10 Marks)

- 7 a. Write the types of measures of dispersion. (03 Marks)
 b. The average breaking strength of steel rods is specified to be 18.5 thousand pounds. To test this sample of 14 rods were tested. The mean and standard deviations obtained were 17.85 and 1.955 respectively. Is the result of experiment significant? (07 Marks)
 c. Calculate Spearman's rank correlation coefficient between demand and sales from the following data and interpret your result:

Demand X	68	64	75	50	64	80	75	40	55	64
Sales Y	62	58	68	45	81	60	68	48	50	70

(10 Marks)

8 **Case Study :**

Using 'Ratio to trend' method, determine the quarterly seasonal indices for the following data:

Production of steel (in million tons)

Year	Q ₁	Q ₂	Q ₃	Q ₄
1	68	60	61	63
2	70	58	56	60
3	68	63	68	67
4	65	56	56	62
5	60	55	55	58

(20 Marks)
