

# CBCS SCHEME

18MBA14



**First Semester MBA Degree Examination, Dec.2023/Jan.2024**

## Business Statistics and Analysis

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 statistical table is permitted.

- 1 a. Mention any three areas where PERT/CPM is used. (03 Marks)  
 b. What are the components of time series analysis? Explain. (07 Marks)  
 c. Find the values of Mean, Median and Mode for the following data :

CI	90-95	95-100	100-105	105-110	110-115	115-120	210-125	125-130
f	4	6	13	18	16	5	3	2

(10 Marks)

- 2 a. Write the difference between correlation and regression. (03 Marks)  
 b. Calculate Karl Pearson's coefficient for of correlation for the following data :

x years	23	27	28	29	30	31	33	35	36	39
y years	18	22	23	24	25	26	28	29	30	32

(07 Marks)

- c. From the data given below find :  
 i) Two regression coefficients  
 ii) Two regression equations  
 iii) The coefficient of correlation between the marks in statistics and research  
 iv) Marks of statistics when marks of research is 30.

Marks in Research :	25	28	35	32	31	36	29	38	34	32
Marks in statistics :	43	46	49	41	36	32	31	30	33	39

(10 Marks)

- 3 a. Discuss the importance of business statistics. (03 Marks)  
 b. You have been provided with figures of sales (in crores) of a company

Year	2016	2017	2018	2019	2020	2021	2022
Sales	77	88	94	85	91	98	90

Fit a straight line by the method of least square and find trend values. Determine the sales for the year 2025. (07 Marks)

- c. Lives of two models of refrigerator in a recent survey are shown in table. What is the average life of each model of these refrigerators? Which model has greater uniformity?

Life (no. of years)		0 - 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12
No. of refrigerators	Model A	5	16	13	7	5	4
	Model B	2	7	12	19	9	1

(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.

- 4 a. What is unbalanced transportation problem? How to balance it. (03 Marks)  
 b. Explain the errors of networks diagram with example. (07 Marks)  
 c. In a manufacturing organization with 5000 employees the mean wage of workers is Rs.8000/- per month with standard deviation of Rs.2000/-. Assuming normal distribution estimate.  
 i) Numbers of workers getting salary below 5000  
 ii) Number of workers getting salary above 12,000  
 iii) Number of workers getting salary between Rs.6000/- and Rs.7000/- (10 Marks)
- 5 a. What is Baye's theorem? (03 Marks)  
 b. If 5% of the electric bulbs manufactured by a company are defective, use Poisson distribution to find the probability that in a sample of 100 bulbs :  
 i) None is defective  
 ii) 5 bulbs will be defective (Given  $e^{-5} = 0.007$ ). (07 Marks)  
 c. Calculate season indices by the 'ratio to moving average method' from the following data of sales (y) of a firm in lakhs of rupees.

Year	I Quarter	II Quarter	III Quarter	IV quarter
2020	68	62	61	63
2021	65	58	66	61
2022	68	63	63	67

(10 Marks)

- 6 a. What is correlation? Write the difference between positive and negative correlation. (03 Marks)  
 b. Use graphical method to solve the following LPP  
 $Z_{\min} = -x_1 + 2x_2$   
 Subject to constraints  
 $-x_1 + 3x_2 \leq 10$   
 $x_1 + x_2 \leq 6$   
 $x_1 - x_2 \leq 2$   
 $x_1, x_2 \geq 0$ . (07 Marks)  
 c. Find the mean deviation from the mean for the following data. Also find Range.

CI	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
f	8	12	10	8	3	2	7

(10 Marks)

- 7 a. Define slack. List its types. (03 Marks)  
 b. The following data represents activities associated with the project in days.

Activities :	A	B	C	D	E	F	G	H	I
Immediate predecessor	-	-	-	A	A	B	C	D	E, F
$t_0$	5	18	26	16	15	6	7	7	3
$t_m$	8	20	33	18	20	9	10	8	4
$t_p$	10	22	40	20	25	12	12	9	5

- i) Draw the networks diagram of activities in project  
 ii) What is the expected project length and variance  
 iii) What is the probability that project will be completed atleast 4 days earlier than expected time. (07 Marks)  
 c. A building project consists of 10 activities. Their estimated duration is given below :

Activity	1-2	2-3	2-4	3-5	3-6	4-5	4-7	5-8	6-8	7-8
Duration (Days)	5	2	6	4	4	2	3	7	8	2

- i) Draw network diagram and determine critical path and project duration.  
 ii) Find Earlier and latest estimates and determine TF. (10 Marks)



- 8 a. Find the initial basic feasible solution for the given transportation problem using :  
NWCR and LCM.

		Distribution centre				Supply
		A	B	C	D	
Place	X	13	7	19	0	200
	Y	17	18	15	7	500
	Z	11	22	14	5	300
Demand		180	320	100	400	

(10 Marks)

- b. Given the following transportation problem :

		Market			Supply
		A	B	C	
Warehouse	1	10	12	7	180
	2	14	11	6	100
	3	9	5	13	160
	4	11	7	9	120
Demand		240	200	220	

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It is known that nothing can be sent from warehouse 1 to market A and from warehouse 3 to market C. solve the problems and determine initial basic feasible solution by VAM.

(10 Marks)

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