Question Paper Code	13363

MBA - DEGREE EXAMINATIONS, NOV / DEC 2024 (JAN - 2025)

First Semester

Master of Business Administration

24MBT104 - BUSINESS STATISTICS & ANALYTICS FOR DECISION MAKING

Regulations - 2024

(Use of *Graphs and Statistical table* is permitted)

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO
1.	State the axioms of probability.	2	K1	CO1
2.	Write the mean and variance of Binomial distribution, If p be the probability of success & n be independent trials.	2	K2	CO1
3.	State Central Limit Theorem.	2	K1	CO2
4.	Mention the properties of a good estimation.	2	K2	CO2
5.	Define Type-I and Type- II error.	2	K1	CO3
6.	Write ANNOVA table for randomized block design.	2	K2	CO3
7.	Discuss about Run test with examples.	2	K2	CO4
8.	What the number of degrees of freedom is for χ^2 calculated from a 'm'x'n' contingency table?	2	K2	CO4
9.	List out the components of time series.	2	K2	CO5
10.	Write the properties of correlation coefficient.	2	K2	CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11. a) Calculate Mean, Median and Mode for the following Data   13   K3   CO1

Class Interval	Frequency
0-10	3
10-20	5
20-30	7
30-40	10
40-50	12
50-60	15
60-70	14
70-80	4
80-90	2
90-100	8

OR

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13363**

b) The contents of urns I, II and III are as follows: 1 white, 2 black and 3 red balls. 2 white, 1 black and 1 red ball, and 4 white, 5 black and 3 red balls respectively. One urn is chosen at random and two balls are drawn from it. They happen to be white and red. What is the probability that they come from urns I, II and III.   *13   K3   CO1*

12. a) A large drug store wants to estimate average weekly sales for a brand of soap. A random sample of 13 weeks gives the following numbers: 123, 110, 95, 120, 87, 89, 100, 105, 98, 88, 75, and 125,101. Find 90% and 95% confidence interval for average weekly sales.   *13   K3   CO2*

OR

b) The lifetime of a particular variety of electric bulbs may be considered as a random variable with mean 1200 hours and standard deviation 250 hours. Using central limit theorem find the probability that the average life time of 60 bulbs exceeds 1250 hours.   *13   K3   CO2*

13. a) Four farmers each used four types of manures for a crop and obtained the yields (in quintals) as below: *13   K3   CO3*

		Treatments			
		1	2	3	4
	A	22	16	21	12
Farmers	B	23	17	19	13
	C	21	14	18	11
	D	22	15	19	10

If there any significant difference between i) farmers ii) manures.

OR

b) The time taken by workers in performing a job by method I and method II   is given below: *13   K3   CO3*

Method I	20	16	26	27	23	22	
Method II	27	33	42	35	32	34	38

Do the data show that the variances of time distribution from population from which these samples are drawn do not differ significantly?

14. a) In an industrial production line items are inspected periodically for defectives. The following is a sequence of defectives items (D) and non- defective items (N) produced by these production line.
DD NNN D NN DD NNNNN DDD NN D NNNN D N D
Test whether the defectives are occurring at random or not at 5% level of significance.   *13   K3   CO4*

OR

b) Below is the table of observed frequencies along with the frequency to the observed under a normal distribution. (Given at n=5, D (0.1)=0.510).
a) Calculate the Kolmogorov Smirnov test statistic.
b) Can we conclude that this distribution does in fact a normal distribution?

13   K3   CO4

Test Score	51-60	61-70	71-80	81-90	91-100
Observed frequency	25	85	400	380	110
Expected frequency	40	110	500	290	60

15. a) Calculate the Karl Pearson's coefficient of correlation between expenditure on advertising and sales from the data given below:

13   K3   CO5

Advertising expenses (Rs)	39	65	62	90	82	75	25	98	36	78
Sales (lakhs Rs.)	47	53	58	86	62	68	60	91	51	84

OR

b) Calculate the trend values by the method of least squares. Also calculate the sales for the years 1999 and 2000.

13   K3   CO5

Year	1991	1992	1993	1994	1995	1996	1997
Sales (in Lakhs)	125	128	133	135	140	141	143

PART - C (1× 15 = 15 Marks)
Compulsory

16. a) Find if there is an association between extravagance in fathers and extravagance in sons from the following data.

15   K3   CO4

	Extravagant father	Miserly father
Extravagant son	327	741
Miserly son	545	234

Determine the coefficient of association also.