Reg. No.															

Question Paper Code	13705

MBA - DEGREE EXAMINATIONS, APRIL / MAY 2025

First Semester

Master of Business Administration

20MBT104 / 24MBT104 - BUSINESS STATISTICS AND ANALYTICS FOR DECISION MAKING

Regulations – 2020 / 2024

(Use of Statistical Table is permitted)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Define probability.	2	K1	CO1
2.	A random variable X has the following probability distribution function Find the value of 'k'.	2	K2	CO1
3.	State central limit theorem.	2	K1	CO2
4.	Explain sampling distribution.	2	K2	CO2
5.	Summarize the types of hypotheses.	2	K2	CO3
6.	Write any two applications of t-distribution.	2	K1	CO3
7.	Explain the uses of chi-square test.	2	K2	CO4
8.	What are the merits of rank correlation method?	2	K1	CO4
9.	List out the components of time series.	2	K1	CO5
10.	Compare correlation and regression.	2	K2	CO5

x	0	1	2	3	4
$P(x)$	k	3k	5k	7k	9k

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	The following table shows the frequency distribution of the diameters of 40 containers. Find the mean & Mode of the following data:	13	K3	CO1

Diameter (mm)	35 – 39	40 – 44	45 – 49	50 – 54	55 – 60
Frequency	6	12	15	10	7

OR

	b)	In a bolt factory, machines A, B and C manufactured 25%, 30% and 40% of the total respectively. A bolt is drawn at random from the produce and is found to be defective. Test the probabilities that it was manufactured by machine A, B and C.	13	K3	CO1
12.	a)	In an automotive safety test conducted by the North Carolina Highway Safety Research center research, the average tire pressure in a sample of 62	13	K3	CO2

tires was found to be 24 pounds per square inch and the standard deviation was 2.1 pounds per square inch.
(a) What is the estimated population standard deviation for this population? (There are about million cars registered in North Carolina)
(b) Calculate the estimated standard error of the mean.
(c) Construct a 95% confidence interval for the population mean.

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. Use central limit theorem to find the probability that the average life time of 60 bulbs exceeds 1250 hours. *13 K3 CO2*

13. a) An IQ test was conducted to 5 Persons before and after they were trained. The results are given below: *13 K3 CO3*

Candidate	I	II	III	IV	V
IQ before training	110	120	123	132	125
IQ after training	120	118	125	136	121

Test whether any change in IQ at 1% level of significance.

OR

b) Three classes A, B and C are studied for proficiency in a subject. The marks secured by a sample of students in each class is given below *13 K3 CO3*

A : 77, 88, 78, 87, 95, 90
B : 55, 66, 77, 76, 65, 58, 59, 62
C : 90, 95, 94, 91, 88, 85, 92

Perform a one way ANOVA to test the hypothesis that all three classes are equally proficient in the subject.

14. a) A psychologist wishes to test if preference of method of learning differs with gender. He asks a group of 146 individuals their preferred method of learning. Below is a table of the results. *13 K3 CO4*
Use chi square test to see if a relationship exists between method of learning and gender.

	Male	Female	Total
Visual	23	17	40
Auditory	13	35	48
Kinaesthetic	30	28	58
Total	66	80	146

OR

b) An experiment designed to compare three preventive methods against corrosion yielded the following maximum depths of pits (in thousands of an inch) in pieces of wire subjected to the respective treatments. *13 K3 CO4*

Method A : 77 54 67 74 71 66
Method B : 60 41 59 65 62 64 52
Method C : 49 52 69 47 56

Use the 0.05 level of significance to test the three samples come from identical population using Kruskal-Wallis H test.

15. a) Given below are the figures of production of a sugar factory: *13 K3 CO5*

Year	2018	2019	2020	2021	2022	2023	2024
Production	40	45	46	42	47	50	46

Solve by least square method and tabulate the trend.

OR

b) Find the co-efficient of correlation and standard error of estimate between X and Y using the following data : *13 K3 CO5*

X :	65	67	66	71	67	70	68	69
Y :	67	68	68	70	64	67	72	70

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

16. a) Obtain the equations of the regression lines from the following data. Hence find the co-efficient of correlation between X and Y. Also estimate the value of (i) y, when $x = 38$ (ii) x, when $y = 18$. *15 K3 CO5*

X:	20	26	29	30	31	31	34	35
Y:	20	20	21	29	27	24	27	31