Reg. No.															

Question Paper Code	12907

MBA - DEGREE EXAMINATIONS, APRIL / MAY 2024

First Semester

Master of Business Administration

20MBT104 - BUSINESS STATISTICS AND ANALYTICS FOR DECISION MAKING

Regulations - 2020

(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 mutually exclusive events.	2	K1	CO1
2. Find the binomial distribution whose mean is 6 and variance is 4?	2	K2	CO1
3. State Central Limit Theorem.	2	K1	CO2
4. What is an Estimator?	2	K1	CO2
5. What are the Type I and Type II errors?	2	K1	CO3
6. Write the uses of F-test?	2	K1	CO3
7. Give the main use of ψ^2 -test.	2	K1	CO4
8. When are non-parametric tests used?	2	K1	CO4
9. Define regression coefficient?	2	K1	CO5
10. The regression equations are x + 6y = 14 and 2x + 3y = 1. Find the correlation coefficient between x & y.	2	K2	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11. a)	In a bolt factory machines A, B, C manufacture respectively 25, 35 and 40 percent of the total. Of their output 5, 4 and 2 percent are defective bolts respectively. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines A, B or C?	13	K3	CO1
	OR			
b)	The average number of acres burned by forest and range fires in a large New Mexico county is 4,300 acres per year, with a standard deviation of 750 acres. The distribution of the number of acres burned is normal. Find the probability that the number acres will be burned in any given year (i) Between 2,500 and 4,200 acres (ii) More than 2200 acres (iii) At most 3600 acres	13	K3	CO1

12. a) Mary, an auditor for a large credit card company, knows that, on average, the monthly balance of any customer is Rs.112, and the standard deviation is Rs.56. If Mary audits 50 randomly selected accounts, What is the probability that the sample average balance is (i) Below Rs.100 (ii)Between Rs.100 and Rs.130. *13 K3 CO2*

OR

b) Two independent samples are chosen from two schools A and B and a common test is given in a subject. The scores of the students are as follows. *13 K3 CO2*

School A : 76 68 70 43 94 68 33
School B : 40 48 92 85 70 76 68 22
Construct a 95% and 99% confidence interval on the mean marks secured by students.

13. a) Ten persons were appointed in the officer cadre in an office. Their performance was noted by giving a test and marks were recorded out of 100. *13 K3 CO3*

Employee :	A	B	C	D	E	F	G	H	I	J
Before Training:	80	76	92	60	70	56	74	56	70	56
After Training :	84	70	96	80	70	52	84	72	72	50

By applying t-test can it be concluded that the employees have been benefited by the training?

OR

b) For the following three samples, *13 K3 CO3*

Sample I : 90 82 79 98 83 91
Sample II : 105 89 93 104 89 95 86
Sample III: 83 89 80 94
Perform an analysis of variance to test at 5% level of significance.

14. a) Two methods of instruction to apprentices is to be evaluated. A Director assigns 15 randomly selected trainees to each of the two Methods. Due to drop outs, 14 complete in Batch 1 and 12 complete In Batch 2. An achievement test was given to these successful Candidates. Their Scores are as follows. *13 K3 CO4*

Method I : 70, 90, 82, 64, 86, 77, 84, 79, 82, 89, 73, 81, 83, 66
Method II : 86, 78, 90, 82, 65, 87, 80, 88, 95, 85, 76, 94
Test whether the two methods have significant difference in effectiveness. Use Mann-Whitney test at 5% significance level.

OR

b) A company's trainees are randomly assigned to groups which are taught a certain industrial inspection procedure by 3 different methods. At the end of the inspection period they are tested for inspection performance quality. The following are their scores. *13 K3 CO4*

Method A: 80 83 79 85 90 68
Method B: 82 84 60 72 86 67 91
Method C: 93 65 77 78 88

Use H test to determine at 0.05 LOS whether the three methods are equally effective.

15. a) 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

OR

b) Find the correlation coefficient for the following data: *13 K3 CO5*

X: 10 14 18 22 26 30
Y: 18 12 24 6 30 36

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

16. a) Take five yearly moving averages and determine short term oscillations from the following data. *15 K3 CO5*

Year	1969	1970	1971	1972	1973	1974	1975	1976	1977
Production	14	17	22	28	26	18	20	24	25