QP CODE: 24800187

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Reg No : .....

Name : .....

M.B.A. DEGREE EXAMINATION, DECEMBER 2023

First Semester

Faculty of Management Science

Core - MB010105 - QUANTITATIVE METHODS

2019 Admission Onwards

F7671416

Time: 3 Hours Maximum Marks: 60

Part A

*Answer any **five** questions. Each question carries **2** marks.*

1. If $A = [\,10 \quad -20 \quad 30\,]$ $B = \begin{bmatrix} -5 & 7 & 5 \\ 6 & -2 & 4 \\ 3 & -2 & 9 \end{bmatrix}$ Find AB

2. *A sum of money amounts to Rs.3258 at 5% p.a. compound interest at the end of 10 years. Find the principal?*

3. What are regression coefficients?

4. What are the uses of studying seasonal variation?

5. What is Fisher's index number?

6. What is the chance of selecting a boy from a class containing 4 girls and 3 boys?

7. What do you mean by power of a test?

(5×2 = 10 Marks)

Part B

*Answer any **five** questions. Each question carries **6** marks.*

8. The ratio of the present ages of the father and son is 7:2. After 5 years, the ratio of their ages would be 8:3. Find the present ages.

9. Calculate the correlation coefficient between the following pairs of values.

X:	100	110	115	116	120	120	125	130	135
Y:	18	18	17	16	16	16	15	13	10

10. Define trend. What are the various methods of measuring it?

11. Using the following data, construct Fisher's Ideal index and show how it satisfies Factor Reversal Test and Time Reversal Test?

Commodity	Price in Rupees per unit		Number of units	
	Base year	Current year	Base year	Current year
A	6	10	50	56
B	2	2	100	120
C	4	6	60	60
D	10	12	50	24
E	8	12	40	36

12. A company has two plants to manufacture scooters. Plant I manufacture 70% of the scooters and Plant II manufactures 30%. At Plant I, 80% of scooters are rated standard quality and at Plant II, 90% of scooters are rated standard quality. A scooter is picked up and is found to be of standard quality. What is the chance that it has come from (a) Plant I (b) Plant II

13. Two sets of ten students selected at random from a college were taken, one was given memory test as they were and the other set was given a memory test after two week's training and the scores were given below.

Set A	10	8	7	9	8	10	9	6	7	8
Set B	12	8	8	10	8	11	9	8	9	9

Test whether there is a significant difference in mean scores. (Table value of t for 18 d.f. = 2.101)

14. In an experiment on immunisation of cattle from tuberculosis the following results are obtained:

	Affected	Not affected
Inoculated	140	30
Not inoculated	60	20

Using chi-square test discuss the effect of vaccine in controlling susceptibility to tuberculosis.

(5×6 = 30 Marks)

Part C

*Answer any **two** questions. Each question carries **10** marks.*

Question number 17 is compulsory .

15. Given below are the figures of production (in lakh kg.) of a sugar factory.

Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
Production	*40*	*45*	*46*	*42*	*47*	*50*	*46*

a. *Fit a straight-line trend by the least square method and tabulate the trend*

b. *Find the trend value for the year 2007*

16. The scores of students in a test follow normal distribution with mean 80 and standard deviation 15. A sample of 1000 students has been drawn from the population. Find (1) appropriate number of students scoring between 65 and 95 (ii) the probability that a randomly chosen student has scores greater than 100.

Compulsory Question

17. From the following data,
    (a) Obtain the two regression lines
    (b) Calculate the Karl Pearson Coefficient of correlation.
    (c) Also estimate the likely demand when the price is Rs. 20.

Price (Rs)	*10*	*12*	*13*	*12*	*16*	*15*
Amount demanded	*40*	*38*	*43*	*45*	*37*	*43*

(2×10 = 20 Marks)