



Shiksha Mandal, Wardha's
G. S. College of Commerce & Economics, Nagpur

An Autonomous Institution

(Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Second Semester Master of Business Administration Examination (CBCS)

QUANTITATIVE TECHNIQUES FOR BUSINESS

(MBC 2.4)

Time: 3 Hours

Maximum Marks: 80

Note: All questions are compulsory.

Q.1 A) Calculate Mean, Median and Mode from the following data:

Wages in (₹) above	330	340	350	360	370	380	390		
No. of Persons	520	470	399	210	105	45	7		10

OR

B) Find out Coefficient of Variation and Coefficient of Skewness from the following data:

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
No. of Students	8	14	36	72	114	200	145	66	32	13

Q.2 A) Calculate coefficient of Rank Correlation between the marks in Economics and Statistics from the following data: 10

Marks in Statistics	15	10	20	28	12	10	16	18
Marks in Economics	16	14	10	12	11	15	18	12

OR

B) From the following data find the regression equations and estimate the likely value of Y when X is 100.

X	74	98	76	82	58	76	94	88	51
Y	124	131	117	131	96	121	136	97	85

Q.3 A) i) A card is drawn from a well-shuffled pack of playing cards. What is the probability that it is either a spade or an ace? 10

ii) A coin is tossed four times. What is the probability that all the four are heads?

OR

B) i) A bag 'A' contains 2 white and 3 red balls and a bag 'B' contains 4 white and 5 red balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that it was drawn from the bag 'B'.

ii) A certain production house process items that are 10% defective. Each item is inspected before being supplied to customers but the inspector incorrectly classifies an item 10% of the time. Only items classified as good are supplied. 820 items in all are supplied, how many of them are expected to be defective?

Q. 4 A) The following are annual profit in thousands of rupees in a certain business: 10

Year	1978	1979	1980	1981	1982	1983	1984
Profit in thousands of Rupees	60	72	75	65	80	85	95

Use the method of least square to fit a straight line to the above data.

- i) Trend line.
- ii) Find out production for the 1987.
- iii) Short term fluctuation & short term oscillation.
- iv) Prove $\sum (Y - Y_c) = 0$.
- v) Prove $\sum Y = \sum Y_c$.

OR

B) Calculate trend values by the method of least squares from the data given below:

Year	2010	2011	2012	2013	2014
Sales of Co. A (₹ lakhs)	70	74	80	86	90

Q.5 A) The table given below show the data obtained during an epidemic of cholera:

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	Attacked	Non Attacked	Total
Inoculated	31	469	500
Non – Inoculated	185	1,315	1,500
	216	1,784	2,000

Under this assumption the expected frequencies are [$\chi^2_{.05}(1) = 3.84$].

Test the effectiveness of inoculation in preventing the attack of cholera. 5% value of χ^2 for one degree of freedom is 3.84.

OR

B) 200 digits were chosen at random from set of tables. The frequencies of the digits are:

Digits	0	1	2	3	4	5	6	7	8	9	Total
Frequency	18	19	23	21	16	25	22	20	21	15	200

Use χ^2 test to assess the correctness of the hypothesis that the digits were distributed in equal numbers in the tables from which they were drawn. (Table value of χ^2 is 16.919 at 5% level of significance & 9 degrees of freedom).

Q.6 A) To study the performance of three detergents and three different water temperatures, the following whiteness readings were obtained with specially designed equipment.

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Water Temperature	Detergent A	Detergent B	Detergent C
Cold Water	57	55	67
Warm Water	49	52	68
Hot Water	54	46	58

Perform a two analysis of variance using 5% level of significance. (Given F 5% = 6.94).

OR

B) The price of a certain commodity was ascertained in each of the four towns A, B, C and D in four quarters of a year. The prices are given below. Are the variations in prices between different towns and in different seasons significant?

	Towns			
Quarters	A	B	C	D
I	60	50	60	50
II	50	40	65	50
III	45	35	45	50
IV	65	45	60	70

Q.7 Answer the following questions in about 75-100 words. (Any Five)

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A) What are the criteria for good measures of central tendency? Explain.

B) What are the types of correlation? Explain.

C) What do you mean by mutually exhaustive events? Explain with example.

D) Give the application of time series analysis.

E) Give the application of χ^2 – distribution.

F) Give the assumptions in F – Test.
