(6 pages)

S.No. 8270 **P 16 MC 22/P 16 FM 21/ P 16 CA 21**

(For candidates admitted from 2016–2021 batch)

M.Com. DEGREE EXAMINATION, NOVEMBER 2023.

Commerce/Financial Management/ Computer Application

QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20)

Answer ALL questions.

1. What do you mean by multiple correlation?

2. State any two limitations of quantitative technique.

3. State the addition theorem.

4. Point out the conditions for binomial distribution.

5. What is called variance analysis?

6. Write down any two assumptions of Chi square test.

7. What is degeneracy?

8. What is unbounded solution?

9. What do you mean by Interpolation?

10. What do you mean by Extrapolation?

PART B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b) in each.

11. (a) Explain the uses of regression analysis.

Or

(b) Calculate the coefficient or correlation between age of cars and annual maintenance cost and comment.

Age of cars (years)	2	4	6	7	8	10	12
Annual maintenance cost (Rs.)	1600	1500	1800	1900	1700	2100	2000

12. (a) Two students X and Y work independently on a problem. The probability that X will solve it is 3/4 and the probability that Y will solve it is 2/3. What is the probability that the problem will be solved?

Or

(b) A university has to select an examiner from a list of 50 persons, 20 of them women and 30 men, 10 of them knowing Hindi and 40 not. 15 of them being teachers and the remaining 35 not. What is the probability of the university selecting a Hindi-knowing woman teacher?

13. (a) A wholesaler in apples claims that only 4% of the apples supplied by him are defective. A random sample of 600 apples contained 36 defective apples. Test the claim of the wholesaler.

Or

(b) Productivity test of two food articles – paddy and wheat gives the following results

	Mean yield (tonnes)	S.D.	No. of hectares
Paddy	80	10	120
Wheat	75	12	90

Is the difference between standard deviation is significant?

14. (a) A company manufactures two products A and B. Each unit of B takes twice as long as to produce one unit of A and if the company is to produce only A, it would have time to produce 2000 units per day. The availability of the raw material is sufficient to produce 1500 units per day of both A and B combined. Product B requiring a special ingredient, only 600 units can be prepared per day. If A fetches a profit of Rs. 2 per unit and B, a profit of Rs. 4 per unit. Formulate the above as an LPP to maximize profit.

Or

(b) Determine an initial basic feasible solution to the following transportation problem using North-West Corner rule.

	D_1	D_2	D_3	D_4	Supply
O_1	6	4	1	5	14
O_2	8	9	2	7	16
O_3	4	3	6	2	5
Required	6	10	15	4	35

15. (a) Use Binomial expansion method to find the value of Y when $X = 5$ from the following data.

X	2	3	4	6	7
Y	1	5	13	61	125

Or

(b) List out the assumptions of interpolation.

PART C — ($3 \times 10 = 30$)

Answer any THREE questions.

16. Calculate three yearly moving average of the following data.

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
No. of students	15	18	17	20	23	25	29	33	36	40

17. A box contains 100 transistors, 20 of which are defective, 10 are selected for inspection. Indicate what is the probability that

(a) all 10 are defective

(b) all 10 are good

(c) at least one is defective.

18. 4 coins were tossed 160 times and the following results were obtained.

No. of Heads	0	1	2	3	4
Observed frequencies	17	52	54	31	6

Under the assumption that coins are balanced, find the expected frequencies of getting 0,1,2,3, or 4 heads and test the goodness of fit.

19. Using simplex method solve the LPP.

Max $Z = 3x_1 + 2x_2 + 5x_3$

Subject to, $x_1 + 2x_2 + x_3 \leq 430$

$3x_1 + 2x_3 \leq 260$

$x_1 + 4x_2 \leq 420$

$x_1, x_2, x_3 \geq 0$

20. Explain the methods of interpolation.

———————