(6 pages)

S.No. 8985 **P 22 MBACC 12**

(For candidates admitted from 2022–2023 onwards)

M.B.A. DEGREE EXAMINATION, NOVEMBER 2023.

Business Administration

MATHEMATICS AND STATISTICS FOR MANAGERS

Time : Three hours Maximum : 75 marks

SECTION A — (20 marks)

Answer ALL questions.

I. (A) Multiple Choice questions: (5 × 1 = 5)

1. A function $f(x)$ is said to have attained its maximum value at $x =$ ————————.

   (a) 0 (b) 1

   (c) b (d) a

2. Graphical method is suitable for ———————— number of variables in LPP.

   (a) 0 (b) 1

   (c) 2 (d) many

3. Formula of mean for discrete series is ————————.

   (a) $\frac{\Sigma X}{N}$ (b) $\frac{\Sigma fX}{N}$

   (c) $\frac{\Sigma fm}{N}$ (d) none

4. A sample is a part of a ————————.

   (a) survey (b) sampling

   (c) population (d) none

5. The value of correlation coefficient is ———————— when the variables are moving in the opposite direction.

   (a) positive (b) negative

   (c) both (d) none

(B) Fill in the blanks: (5 × 1 = 5)

6. For a maximum point $\frac{dy}{dx} = 0$ and $\frac{d^2y}{dx^2}$ is ————————.

7. Skewness is a degree of ————————.

8. The objective function may be of ———————— type.

9. Regression means ————————.

10. The value of correlation coefficient lies between ————————.

II. Answer ALL questions. (5 × 2 = 10)

11. Explain Cramer's rule.

12. Define Kurtosis.

13. Write the formula for rank correlation coefficient.

14. Define probability.

15. Define sample space.

SECTION B — (5 × 5 = 25)

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

16. (a) Solve the following equation using Cramer's rule: $2x - y = 5$, $3x + 2y = -3$.

Or

(b) Investigate maxima and minima of the function: $2x^3 + 3x^2 - 36x + 10$.

17. (a) Explain the procedure for formulation of an LPP.

Or

(b) Solve graphically

Minimize $Z = -3x_1 + 4x_2$

Subject to $x_1 + x_2 \leq 4$

$2x_1 + 3x_2 \geq 18$

and $x_1, x_2 \geq 0$.

18. (a) Find the mean and median for the following data:

Wages Rs. :	10	15	17	18	21	Total
No. of Labourers:	4	16	12	5	3	40

Or

(b) Calculate the standard deviation for the following series:

X:	6	9	12	15	18
F:	7	12	13	10	8

19. (a) Explain Stratified random sampling procedure.

Or

(b) In a college, 200 students are studying Arts, 300 Science and 500 Commerce and Business Management. 40 students are to be selected by proportional allocation. Determine how many students are to be selected from each group.

20. (a) Calculate the Correlation coefficient for the following data:

X:	10	12	18	8	13	20	22	15	5	17
Y:	88	90	94	86	87	92	96	94	88	85

Or

(b) Rankings of ten trainees at the beginning (X) and at the end (Y) of a certain course are given below :

X:	1	6	3	9	5	2	7	10	8	4
Y:	6	8	3	7	2	1	5	9	4	10

Calculate Spearman's rank correlation co-efficient.

SECTION C — $(3 \times 10 = 30)$

Answer any THREE questions.

21. Apply Gauss – Jordan method to find the solution of the following system:

$10x + y + y + z = 12$, $2x + 10y + z = 13$, $x + y + 5z = 7$.

22. Solve graphically:

Maximize $Z = 3x_1 + 4x_2$

Subject to $4x_1 + 2x_2 \leq 80$

$2x_1 + 5x_2 \leq 180$

and $x_1, x_2 \geq 0$.

23. Calculate Standard deviation for the following data:

Life span:	4-6	6-8	8-10	10-12	12-14	Total
No. of Neon Lights:	10	17	32	21	20	100

24. Explain about non – random sampling methods.

25. Calculate correlation coefficient for the following data:

X:	12	9	8	10	11	13	7
Y:	14	8	6	9	11	12	3