THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2023

(Regular/Improvement/Supplementary)

BBA / B.Com.

GBCM3A01T: BASIC NUMERICAL METHODS

Time: 2 ½ Hours   **Maximum Marks: 80**

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 25 Marks)

1. Two third of a number increased by 3 equals 13. Find the number.

2. Solve $x^2 - 11x + 24 = 0$ by factorization method.

3. Define a singular matrix. Give an example.

4. Construct a 2×3 matrix $A = [a_{ij}]$, whose elements are given by $a_{ij} = \dfrac{i + 2j}{3i}$

5. If $A = \begin{bmatrix} 0 & 3 \\ 3 & 1 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ 1 & 3 \end{bmatrix}$, find AB

6. Find 10th term of series 9, 6, 4…………….

7. Three numbers in ascending order are in GP such that their product is 512. Find the middle number.

8. Which term of the series 21, 18, 15, …………………… is -81 ?

9. Mr. Anand saved Rs.33,000 in ten years. In each year after the first he saved Rs.200 more that he did in the preceding year, how much did he save in the first year?

10. Give the formula to find present value of a lump sum.

11. How much would a zero coupon bond sell today, that pays Rs. 1,000 in 10 years, assuming an interest rate of 5% compounded and paid annually?

12. If the amount for 2 years at 6% is 4,000, what was the principal?

13. What are raw and central moments?

14. Define standard deviation. The sum of 12 items is 15 and the sum of their squares is 148. Find the standard deviation.

15. What are the merits and demerits of mean deviation?

(PTO)

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 35 Marks)

16. Find A^{-1} *if* $A = \begin{bmatrix} 1 & 1 & 3 \\ 2 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix}$

17. The first and the last terms of an AP are – 6 and 244 respectively and the sum of the AP is 12019. Find the number of terms in the A.P and the common difference.

18. Calculate total interest on Rs.15,000 for 150 days, Rs. 2,500 for 77 days and on Rs.5,800 for 6 months all @ 7% per annum simple interest.

19. Find the effective rate of interest if interest is calculated at 10% half yearly.

20. Find out the EMI for 2 Lakh for the tenure of 3 years. The rate of interest is 10% per annum.

21. Why is standard deviation considered to be the best measure of dispersion?

22. Find Bowley's coefficient of skewness from the following data.

Class	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29
f	5	11	15	23	18	12

23. Distinguish between skewness and kurtosis.

SECTION C: Answer any *two* questions. Each carries *ten* marks.

24. Solve $x + y - z = 4$, $x - 2y + 3z = -6$, $2x + 3y + z = 7$

25. Solve the following system of equations using matrices.

$$x - 2y + z = 3 , \ 2x + y - z = 5 , \ 3x - y + 2z = 12$$

26. Mr. Sanjay borrows Rs.8,190 without interest and repays the loan in 12 monthly installments, each installment being twice the preceding one. Find the first and the last installments.

27. Calculate the mean, median and mode for the following data:

Class	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90
Frequency	50	160	151	165	75	79	64	56

(2 x 10 = 20 Marks)