D3BCM2301

THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2024

(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. Distinguish between mean deviation and standard deviation.

2. Find two numbers whose sum is 45 and the difference is 4.

3. Find a if $\begin{vmatrix} 2 & a \\ 4 & 8 \end{vmatrix} = 20$.

4. What is compound annual growth rate?

5. What are the merits and demerits of arithmetic mean as a measure of central tendency?

6. Which term of the G.P 2, 8, 32 ………………. up to 'n' terms is 131072?

7. Find the sum of the series $1 - 1/2 + ¼ - 1/8 + $ ……………… to 12 terms.

8. In a G.P the first term is 6 and 16th term is 196608. Find the common ratio.

9. Define mode. Compute mode to the following data:

Size of shoes	3	4	5	6	7	8	9
No. of pairs sold	12	35	23	34	65	42	34

10. A divided stream commencing one year hence at Rs. 66 is expected to grow at 10% per annum for 15 years and then ceases. If the discount rate is 21%, what is the present value of the expected series?

11. What is square matrix? Give an example.

12. Give the formula to find the simple interest, also explain each term.

13. Find the matrices A *and* B if $A + B = \begin{bmatrix} 5 & 2 \\ 6 & -3 \end{bmatrix}$ and $A - B = \begin{bmatrix} 9 & 4 \\ 8 & -7 \end{bmatrix}$

14. Seventh and 12th terms of an AP are 10 and 20. Find the first term and common difference.

15. Solve $x^2 + 3x - 10 = 0$ by factorization method

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

16. Solve the following system of equations using Cramer's rule:

$$2x + 3y = 3 \ , \ 5x + 4y = 11$$

17. If the value of a product is depreciated 20% annually, what will be its estimated value at the end of 10th year if its present value is Rs.5000?

18. Find the compound interest for Rs. 10,000 for 3 years at 5% per annum.

19. B borrowed Rs. 6,000 from a money lender but he could not pay any amount in a period of 4 years. Accordingly, the money lender demanded now Rs. 7,500 from him. What rate percent per annum compound interest did the latter required for lending his money?

20. Find out the EMI for Rs. 5 Lakh for the tenure of 3 years. The rate of interest is 10% per annum.

21. Given the following information on scores (x) of two batsmen A and B during a certain season:

	A	B
No. of Tests	20	30
$\sum x$	450	552
$\sum x^2$	10180	11340

Compare A and B for average and variability of scores.

22. What is dispersion? Discuss the role of standard deviation in statistical theory and practice.

23. The mean weight of 80 boys is 60 kg and the mean weight of 70 girls is 72 kg. Compute the mean weight of all the 150 persons.

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

24. Solve $16x + 16y + 17z = 10$, $-14x + 17y - 3z = 75$, $-5x - 11y - 18z = 43$.

25. a) Find A^{-1} *if* $A = \begin{bmatrix} -8 & 1 & 4 \\ 4 & 4 & 7 \\ 1 & -8 & 4 \end{bmatrix}$.

    b) Find the rank of the matrix $\begin{bmatrix} 1 & 5 \\ 8 & 3 \end{bmatrix}$.

26. The rate of monthly salary of a person is increased annually in A.P. It is known that he was drawing Rs. 400 a month during the 11th year of his service and Rs. 760 during the 29th year. Find:

    (1) Starting salary.

    (2) Annual increment.

    (3) Salary after 20 years.

    (4) Salary after 32 years.

27. Calculate Bowley's coefficient of skewness from the following data.

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 - 35
f	13	15	16	10	12	8	2

(2 x 10 = 20 Marks)