D 51695　　　　　　(Pages : 2)　　　　　Name..

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THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION NOVEMBER 2023

Common Course (B.Sc. LRP (Alternate Pattern))

A11—BASIC NUMERICAL METHODS

(2019—2022 Admissions)

Time : Two Hours and a Half　　　　　　　　　　　　　Maximum : 80 Marks

Part A

Answer **all** *questions.*

1. What is symmetric matrix ?

2. What is linear equation ?

3. What do you mean by range ?

4. What do you mean by Fibonacci Numbers ?

5. What is geometric progression ?

6. What is harmonic sequence ?

7. What is Annuity ?

8. How do you calculate median.

9. Find mode 4, 2, 6, 8, 7, 9, 1.

10. What do you mean by absolute measure of dispersion ?

11. What do you understand by determinants ?

12. Find the 2th term of an A.P 6, 2, – 2.

13. What do you understand by Cramer's rule ?

14. What is arithmetic mean ?

15. What is diagonal matrix ?

(15 × 2 = 30 Maximum Ceiling 25 Marks)

Turn over

Part B

*Answer **all** questions.*

16. Explain the utility of statistics.

17. Check whether the following matrix is singular or non-singular

$$A = \begin{bmatrix} 1 & 2 & -1 \\ -3 & 4 & 5 \\ -4 & 2 & 6 \end{bmatrix}.$$

18. Calculate the range and co-efficient of range from the following data :

    Marks scored by 12 students in a test : 31, 18, 27, 19, 25, 28, 49, 14, 41, 22, 33, 13

19. Find the sum of all natural numbers lying between 101 and 199, which are multiples of 5.

20. 'x' and 'y' are two numbers whose AM is 25 and GM is 7. Find the numbers.

21. What is the rate of simple interest per annum at which a sum of money doubles itself in $16^{2/3}$ years.

22. Solve, by Cramer's rule, the system of equations $x1 - x2 = 3$, $2x1 + 3x2 + 4x3 = 17$, $x2 + 2x3 = 7$.

23. If the first term of a G.P. is 20 and the common ratio is 4. Find the 5th term.

(8 × 5 = 40 Maximum Ceiling 35 Marks)

Part C

*Answer any **two** questions.*

24. What is Statistics ? Elaborate the characteristics of statistics and stages of statistical enquiry.

25. If $A = \begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ find the products AB and BA and hence solve the

    system of equations $x - y + z = 4$, $x - 2y - 2z = 9$, $2x + y + 3z = 1$.

26. The population of a town decreased every year due to migration, poverty and unemployment. The present population of the town is 6, 31, 680. Last year the migration was 4 %, and the year before last, it was 6 %. What was the population two years ago ?

27. Rahul and Rohan have 45 marbles together. After losing 5 marbles each, the product of the number of marbles they both have now is 124. How to find out how many marbles they had to start with.

(2 × 10 = 20 marks)