D 111906 **(Pages : 3)** **Name.....**

Reg. No.....

THIRD SEMESTER (CBCSS–UG) DEGREE EXAMINATION, NOVEMBER 2024

B.Sc. LRP (Alternate Pattern)

A11—BASIC NUMERICAL METHODS

(2019—2023 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

All *questions can be attended.*
Each questions carries 2 *marks.*

1. What do you mean by Kurtosis ?
2. Define 'matrix'.
3. What is Harmonic mean ?
4. What is meant by Quartile Deviation ?
5. What is a Lorenz Curve ?
6. What do you mean by classification and tabulation of data ?
7. What do you mean by an Arithmetic Progression ?
8. What is variance ?
9. What do you mean by median and mode ?
10. What is EMI ?
11. What do you understand by Perpetuity ?
12. Given that simple interest on a certain sum of money is Rs. 4,016.25 at 9 % per annum in 5 years. Find the sum of money.
13. Calculate the range and coefficient of range from the following data :—

    The heights of 10 children in cm. : 122, 144, 154, 101, 168, 118, 155, 133, 160, 140.
14. What is the common difference of the AP 11, – 1, – 13, – 25, … ?
15. A sum of Rs. 25,000 will become Rs. 31,000 in 48 months at some rate of simple interest. Find the rate of interest per annum.

(15 × 2 = 30 marks)
Max. Ceiling : 25 marks

Turn over

Section B

All *questions can be attended.*
Each questions carries 5 *marks.*

16. Solve the system of equations :

$$\begin{aligned} 2x + 3y &= 8 \\ 3x + 5y &= 10. \end{aligned}$$

17. The Arithmetic Mean of two numbers is 10 and their Geometric Mean is 8. Find the numbers.

18. Briefly explain the various functions of Statistics.

19. List out the merits and demerits of Arithmetic Mean.

20. A sum of Rs. 800 amounts to Rs. 920 in 3 years at simple interest. If the interest rate increases by 3 %, what will be the amount ?

21. Karl Pearson's coefficient of skewness of a distribution is 0.32. Its standard deviation SD is 6.5 and the mean is 29.6. Find the mode and median of the distribution.

22. Calculate the adjoint of the matrix :

$$A = \begin{bmatrix} 1 & -1 & 2 \\ 2 & 3 & 5 \\ 1 & 0 & 3 \end{bmatrix}.$$

23. Determine the 31st term of an AP, if its 11th term is 38 and its 16th term is 73.

(8 × 5 = 40 marks)
Max. Ceiling : 35 marks

Section C

Answer any **two** *questions.*
Each questions carries 10 *marks.*

24. What do you mean by compound interest ? How is it different from simple interest ? Also, explain the concepts of the nominal, real and effective rates of interest with suitable examples.

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

$$\begin{aligned} 2x - y + 3z &= 9 \\ x + y + z &= 6 \\ x - y + z &= 2. \end{aligned}$$

26. Find the mean, median and mode of the following data :

Classes	…	0—10	10—20	20—30	30—40	40—50	50—60	60—70
Frequency	…	5	10	18	30	20	12	5

27. Check whether the following are quadratic equations :

(a) $(x + 1)^2 = 2(x - 3)$.

(b) $x^2 - 2x = (-2)(3 - x)$.

(c) $(x - 2)(x + 1) = (x - 1)(x + 3)$.

(d) $(2x - 1)(x - 3) = (x + 5)(x - 1)$.

(2 × 10 = 20 marks)