D 51670 (Pages : 3) Name.....

Reg. No.....

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION NOVEMBER 2023

B.Com./B.B.A

A11—BASIC NUMERICAL METHODS

(2019—2022 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Answer should be written in English Only.

Part A

Answer **all** *questions.*

1. What is mean by an equation ?
2. Define a simultaneous equation in three variables.
3. Define a scalar matrix.
4. Define order of a matrix.
5. Show that $\begin{bmatrix} 2 & -1 & 3 \\ -1 & 2 & 1 \\ 3 & 1 & 4 \end{bmatrix}$ is symmetric.
6. Explain determinant of a 3 × 3 matrix with an example.
7. Define geometric progression and write the formula for finding n^{th} term of G.P
8. Define Harmonic progression.
9. Define immediate annuity.
10. What is mean by growing perpetuity ?
11. Define nominal rate of interest.
12. Explain the merits and demerits of mode.

Turn over

13. Define geometric mean.

14. Define mean deviation.

15. What are absolute measures of dispersion ?

(15 × 2 = 30, Maximum ceiling 25 marks)

Part B

Answer **all** *questions.*

16. Solve $14x - 28 + 2x - 4 = 6 + 2x - 10$.

17. Solve $x + y = 4$, $4x^2 - 3y^2 = 33$.

18. Demand for goods of an industry is given by the equation $pq = 100$ and supply is given by the equation $20 + 3p = q$ where p is the price and q is the quantity.

    Find p and q.

19. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, show that $A^2 - 4A - 5I = 0$.

20. Define arithmetic mean and also insert four arithmetic mean between 52 and 77.

21. If the 5^{th} and the 10^{th} terms of a G.P are 32 and 1024 respectively. Find the first term and the common ratio.

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

23. Find the arithmetic mean of the following data :

Marks	:	10	20	30	40
No of students	:	40	32	12	5

(8 × 5 = 40, Maximum ceiling 35 marks)

Part C

Answer any **two** *questions.*

24. If $A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & 0 \\ 1 & 1 & 4 \end{bmatrix}$, show that $AA^{-1} = A^{-1} A = I$.

25. Solve the system of linear equation :

$x + y + z = 7$

$x + 2y + 3z = 16$

$x + 3y + 4z = 22$.

26. (a) Define annuity and explain different types of annuities.

(b) Find the total amount of annuity of Rs. 400 payable at the end of every quarter for 6 years at 8 % per annum compounded quarterly.

27. (a) Define quartile deviation and explain its merits and demerits.

(b) Using quartile deviation compare the following series and state which one is more variables ?

Series 1	:	5	10	27	90	38	56	29	43	39	86	30
Series 2	:	10	27	15	35	89	72	28	40	45	28	39

(2 × 10 = 20 marks)