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)

D 31730 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2022

B.Com./B.B.A.

A 11—BASIC NUMERICAL METHODS

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 80 Marks

Part A

Answer **all** *questions.*

1. What is pure quadratic equation ?
2. What is meant by roots of the quadratic equation ?
3. What do you mean by the minor element of a matrix ?
4. What is triangular matrix ?
5. What is Skew Symmetric Matrix ?
6. Define harmonic progression.
7. What is meant by convergent series ?
8. What is Annuity ?
9. What is effective annual interest rate ?
10. What is Median ?
11. State any *two* merits of arithmetic mean.
12. Define quartile deviation.
13. Define Variance.
14. How do you calculate range and its co-efficient ?
15. What is positive skewness ?

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

Turn over

Part B

Answer **all** *questions.*

16. Solve $18 + 10x + 3x = 106 - 5x$.

17. Solve the equation $x^2 + 7x = 60$.

18. Find the determinant of $A = \begin{bmatrix} 4 & 1 & 2 \\ 1 & 2 & 5 \\ 2 & 7 & 8 \end{bmatrix}$.

19. Find the 10^{th} term of Arithmetic progression : 4, 8, 12.....

20. Three numbers in ascending order in geometric progression such that their product is 729. Find the middle number.

21. Calculate simple interest and amount at end of the 7^{th} year for Rs. 15,000 at 9 % per annum.

22. Find median for the values : 85, 57, 63, 9, 74, 34, 36, 93.

23. Calculate Arithmetic mean from the following data :

Values	:	10	20	30	40	50	60	70	80
Frequency	:	5	8	12	17	15	12	10	4

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

Part C

Answer any **two** *questions.*

24. Solve the following equations by using Cramer's rule :

$2x + 3y = 7$
$4x + 2y = 10$.

25. Find compound interest for Rs. 5,000 for 5 years if interest is payable annually at 5 % p.a

26. Find the 8^{th} term and 9^{th} term of the geometric progression 5, 10, 20....

27. Calculate Standard deviation and co-efficient of variation from the following values :

Size	:	2	4	6	8	10	12
Frequency	:	2	4	5	6	7	8

(2 × 10 = 20 marks)

D 11958 **(Pages : 3)** **Name.....**

Reg. No.....

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION NOVEMBER 2021

Common Course (B.Com./B.B.A.)

A11—BASIC NUMERICAL METHODS

(2019—2020 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. What do you mean by time value of money ?
2. What is conversion period ?
3. What is co-efficient of variation ?
4. What is assumed mean method ?
5. What is positive skewness ?
6. What do you mean by mode ?
7. What is geometric progression ?
8. What you mean by kurtosis ?
9. Find the 10^{th} term of the series : 11, 15, 19, 23,....
10. In how many years will a sum of Rs. 4,000 yield a simple interest of Rs. 1,440 at 12 % per annum ?
11. Calculate mean : 11,4, 6, 6, 8, 9, 3
12. What is co-efficient of range ?
13. What is quartile deviation ?

Turn over

14. Write down the formulae for calculating median from discrete and continuous data ?

15. What do you mean by a system of linear equations ?

(10 × 3 = 30 marks)

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. The arithmetic mean between two numbers is 75 and their geometric mean is 21. Find the numbers.

17. Find the range and coefficient of range of the following data :

    43.5, 13.6, 18.9, 38.4, 61.4, 29.8

18. What do you mean by compound interest ? How it is different from simple interest ?

19. If Karl Pearson's co-efficient of skewness is 0.21, mean is 43 and median is 40, find the co-efficient of variation.

20. Mr. Thomas invested an amount of Rs. 13,900 divided in two different schemes A and B at the simple interest rate of 14 % p.a. and 11 % p.a. respectively. If the total amount of simple interest earned in 2 years be Rs. 3508, what was the amount invested in Scheme B ?

21. Mr. Ajmal took a personal loan of Rs. 3,00,000. He is asked to repay the loan in 4 years and rate of interest is 9 % p.a. Calculate EMI amount.

22. Solve the system of equations :

    $2x + 3y = 8,\ 3x + 5y = 10.$

23. Find the mean deviation and co-cefficient of mean deviation of 3, 6, 6, 7, 8, 11, 15, 16

(5 × 6 = 30 marks)

Section C

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

24. What are the requisites of a good average ? List out the merits and demerits of arithmetic mean. Explain the empirical relation between mean, median and mode with a suitable example.

25. If $A = \begin{pmatrix} -3 & 1 \\ -2 & 4 \\ 5 & -1 \end{pmatrix}$ and $B = \begin{pmatrix} 4 & -3 \\ 0 & -2 \\ -2 & 4 \end{pmatrix}$, then what is $3A - 2B$?

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

$2x + y - 2z = -1,\ 3x - 3y - z = 5,\ x - 2y + 3z = 6.$

27. The following data gives the number of vehicles sold by a major Toyota Showroom in a day was recorded for 10 working days. Find the inter quartile range, quartile deviation and its co-efficient :

Day	:	1	2	3	4	5	6	7	8	9	10
Frequency	:	20	15	18	5	10	17	21	19	25	28

(2 × 10 = 20 marks)

D 92876 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER (CBCSS–UG) DEGREE EXAMINATION, NOVEMBER 2020

B.Com./B.B.A.

A 11—BASIC NUMERICAL METHODS

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. What is a matrix ?
2. What is compound interest ?
3. What is a linear equation ?
4. What do you mean by a sequence?
5. What is EMI ?
6. What do you mean by deferred perpetuity?
7. What do you mean by dispersion ?
8. What do you mean by singular and non-singular matrix?
9. Define Arithmetic Mean.
10. What do you mean by continuous series ?
11. What is negative skewness ?
12. Find next number in the sequence 1, 4, 9, 16, 25, x.
13. What is range ?
14. What do you mean by standard deviation ?
15. What is Geometric Mean ?

(10 × 3 = 30 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. Solve $4(x-1)+1=5(2x+1)-6$.

17. What is $\begin{bmatrix} 2 & -3 \\ -4 & 2 \end{bmatrix} - \begin{bmatrix} -1 & -5 \\ 3 & -2 \end{bmatrix}$?

18. At what rate percent per annum will a sum of money double in 8 years ?

19. Find out the median from the following data :

Age	10	5	7	12	8
No. of Students	15	20	15	28	12

20. Find two natural numbers whose sum is 27 and product is 182.

21. The first term of an Arithmetic Progression is 15 and the last term is 85. If the sum of all terms is 750, what is the 6th term ?

22. What is mean deviation ? What are its merits and limitations ?

23. A bank offers 5% compound interest calculated on half-yearly basis. A customer deposits Rs. 1,600 each on 1st January and 1st July of a year. Calculate the amount he would have gained by way of interest at the end of the year.

(5 × 6 = 30 marks)

Section C

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

24. What are the major measures of central tendency ? List out the merits and limitations of each measures.

25. A man constructed his house by taking a home loan of Rs. 15,00,000. He is asked to repay the loan in 5 years and rate of interest is 13% p.a. Calculate EMI.

26. Find a solution to the following system by using Cramer's rule :

$x - 2y + 3z = 9, -x + 3y - z = -6, 2x - 5y + 5z = 17.$

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

Wages	0–50	50–100	100–150	150–200	200–250	250–300	300–350
No. of Employees	2	3	5	6	5	3	1

(2 × 10 = 20 marks)