D 130925 **(Pages : 3)** **Name.....**

Reg. No.....

THIRD SEMESTER B.VOC. DEGREE EXAMINATION
NOVEMBER 2025

Common Course

A11—BASIC NUMERICAL SKILLS

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A (Short Answers)

Answer **all** *questions.*
Each question carries 2 *marks.*
Ceiling marks for Section A is 25 *marks.*

1. Define (i) union of two sets ; and (ii) intersection of two sets.
2. What is a Pie diagram ?
3. Define (i) Mean ; (ii) Median; and (iii) Mode.
4. Represent the following frequency table by histogram :

Marks	:	10-15	15-20	20-25	25-30	30-35
Number of students	:	40	10	20	15	5

5. Find the 10^{th} term of the AP : 3, 7, 11, 15,...
6. Find the value of x if $2(x-1)=4-3(x+2)$.
7. If $A=\{5,6,7\}$ and $B=\{5,8,9\}$, find $A \cap B$.
8. Calculate the 'Harmonic Mean' of 1, 2, 4.
9. Evaluate the determinant of the matrix :

$$\begin{pmatrix} 3 & 4 \\ 1 & 2 \end{pmatrix}.$$

10. Solve the quadratic equation $x^2-5x+6=0$.

Turn over

11. What are the components of a 'Time Series' ? Name any *two*.

12. Find the 'Standard Deviation' for the data set : 3, 3, 3, 3.

13. Find the 'sum to infinity' of the GP : $1, 1/3, 1/9, ..$

14. Give one example each of a 'Unit Matrix' and a 'Zero Matrix' of order 2×2.

15. Briefly explain the term 'Skewness'.

Section B (Paragraphs)

Answer **all** *questions.*
Each question carries 5 *marks.*
Ceiling marks for Section B is 35 *marks.*

16. Given $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{1, 3, 5, 7\}$, and $B = \{2, 4, 6\}$, verify that $(A \cup B)' = A' \cap B'$.

17. Solve the system of linear equations using the Elimination Method :

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

18. What are the qualities of a 'Good Average' in Statistics ?

19. Find the Geometric Mean from the following distribution :

x	:	2	4	8	16
f	:	1	2	3	1

20. A person saves Rs. 100 in the first month, Rs. 200 in the second, Rs. 300 in the third, and so on. In how many months will his total savings be Rs.12,000 ?

21. Find the inverse of the matrix :

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}.$$

22. Calculate the Mode for the following data :

5, 8, 10, 8, 12, 10, 8, 15, 10, 8, 20

23. Give three yearly moving averages for the following data (incomplete data, will show structure only) :

Year	:	2010	2011	2012	2013	2014	...
Value	:	11.2	12.3	12.1	13.2	13.3	13.9

Section C (Essays)

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

24. Calculate the Mean Deviation about the Mean for the following frequency distribution :

Class	:	0-10	10-20	20-30	30-40	40-50
Frequency	:	5	8	15	16	6

25. Solve the system of equations :

$$x + y + z = 6$$
$$2x - y + z = 3$$
$$x + 2y - z = 2.$$

26. Find the sum of the series up to n terms : $0.7 + 0.77 + 0.777 + ...$

27. Explain the different methods of collecting Primary Data in a statistical investigation, highlighting their merits and demerits.

(2 × 10 = 20 marks)