C 85731 Name...............................

Reg. No...........................

SECOND SEMESTER B.VOC. DEGREE EXAMINATION, APRIL/MAY 2015

(CUCBCSS—UG)

GEC 2NM 06—BASIC NUMERICAL SKILLS

Time : Three Hours   Maximum : 80 Marks

Part I

*Answer **all** questions.*
*Each question carries **1 mark**.*

Choose the correct answer from the choices given :

1 The graphical representation of a cumulative frequency distribution is called :

    (a) Histogram.   (c) **Frequency** polygon.

    (b) Ogive.   (d) Frequency curve.

2 Let $X = \{1, 2, 3, 4\}$ and A c X is given by $A = \{1, 3\}$. Then A' is :

    (a) {**1,** 2).   (c) (2, 4).

    (b) (1, 3).   (d) (2, 3).

3 A matrix having only one row is called :

    (a) Column matrix.   (c) Identity matrix.

    (b) Row matrix.   (d) Zero matrix.

4 Which of the following is the arithmetic mean between a and b ?

    (a) $\dfrac{a + b}{2}$ *(c)* $a + .b.$

    (b) $\dfrac{a - b}{2}$ *(d)* $a - b.$

5 Which of the following results hold for a set of observations ?

    (a) AM GM HM.   (c) AM > GM > HM.

    (b) HM GM ≥ AM.   (d) GM > AM > HM.

Turn over

Fill in the Blanks :

6 A time series is a set of values arranged in _____ order.

7 Find the 25th term of the AP given by 21, 16, 11, 6, _____

8 Find the arithmetic mean between 12 and 88.

9 Find the 10th term of the geometric progression 5, 25, 125, _____

10 When 5 is added to the observations, then mean is _____

(10 x 1 = 10 marks)

Part II

Answer any eight *questions.*
Each question carries 2 marks.

11 Find AB if $A = \begin{bmatrix} 1 & -2 \\ 2 & 3 \end{bmatrix}$, and $B = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}$

12 Find A+ B and A— B if $A = \begin{bmatrix} 11 & 9 & 5 \\ 8 & 6 & 13 \\ 10 & 9 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 0 & 2 \\ 1 & 2 & 6 \\ 9 & 5 & 3 \end{bmatrix}$

13 Determine whether the matrix $A = \begin{bmatrix} 4 & 2 \\ 1 & 3 \end{bmatrix}$ is non-singular.

14 Solve the following quadratic equation using the quadratic formula :
$3x^2 - 35x + 22 = 0$.

15 Using Venn diagram to prove $(A \cup B)' = A' \cap B'$.

16 What you mean by frequency distribution ?

17 Why Fisher's Index Number is designated as Ideal ?

18 Explain the uses of graph and diagrams.

19 The first four moments of a distribution are 0, 2.5, 0.7 and 18.75. Comment on the kurtosis of the distribution.

20 The marks obtained by seven students are 5, 10, 15, 20, 25, 30, 45. Find harmonic mean.

(8 x 2 = 16 marks)

Part III

Answer any **six** *questions.*
Each question carries **4** *marks.*

21 Explain the main parts of a statistical Table.

22 Calculate median:

Marks (less than) :	15	30	45	60	75	90
No. of students	18	35	62	81	95	100

23 Construct the cost of living index number from the following :

Group	A	B	C	D	E
Index	350	200	240	150	250
Weight	5	2	3	1	2

24 Define union and intersection of two sets. Give their Venn diagram representation.

25 Find Adj (A) if $A = \begin{vmatrix} 2 & 3 & -1 \\ 0 & 1 & 2 \\ 4 & 3 & 5 \end{vmatrix}$

26 If $A = \begin{bmatrix} 6 & 5 \\ -2 & - \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -4 \\ 3 & -1 \end{bmatrix}$ find 2A – 3B and 2A + 3B.

27 Find the inverse of the matrix $A = \begin{vmatrix} 1 & -1 & 2 \\ 0 & 2 & 3 \\ 3 & -2 & 4 \end{vmatrix}$

28 If $A = \begin{vmatrix} 8 & 6 & 2 \\ 3 & 5 & 4 \\ 0 & 1 & 2 \end{vmatrix}$ and $B = \begin{vmatrix} 1 & 5 \\ 2 & 8 \\ 3 & 9 \end{vmatrix}$, Find AB.

(6 x 4 = 24 marks)

Turn over

Part IV

Answer any two questions.
Each question carries **15** *marks.*

29 Use Cramer's rule to solve the system of equations :

$2x_1 + 8x_2 + 2x_3 = 67$

$4x_1 + 6x_2 + 9x_3 = 36$

$7x_1 + x_2 + 5x_3 = 49.$

30 Solve the following equations by Matrix method :

$x + y + z = 210$

$x + 2z = 230$

$x + y = 120.$

31 Below are given the figures of production (in thousand tons) of a sugar factory :

Year	2005	2006	2007	2008	2009	2010	2011
Production	77	88	94	85	91	98	90

(a) Fit a straight line by the method of least squares and find the trend values.

(b) What is the monthly increase in production ?

(c) Compute short term fluctuations.

(2 x 15 = 30 marks)