

B.C.A Semester - 2 (CBCS) Examination

March/April– 2019 (New Course)

Foundation of Mathematics and Statistics(CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Question: 1 (A) Answer the following questions.

03

- (1) How many elements in 3x3 determinant ____ ?
- (2) $(AB)^{-1} =$ _____.
- (3) Every element of a matrix is zero, it is called _____ matrix.

Question: 1 (B) Answer the following question. (Any two)

06

- (1) Find the determinant of matrix $A = \begin{vmatrix} 5 & 2 & -4 \\ 6 & 3 & 1 \\ -3 & 4 & 2 \end{vmatrix}$
- (2) Find the determinant of matrix $A = \begin{vmatrix} 2 & 1 & 5 \\ -6 & 7 & 1 \\ 3 & 4 & -5 \end{vmatrix}$
- (3) Find the determinant of matrix $A = \begin{vmatrix} 8 & 7 & -5 \\ 3 & -1 & 2 \\ 7 & 2 & -2 \end{vmatrix}$
- (4) Find the determinant of matrix $A = \begin{vmatrix} -2 & 6 & 1 \\ -2 & 8 & 2 \\ 7 & 5 & -4 \end{vmatrix}$

Question: 1 (C) Answer the following question. (Any one)

05

- (1) Solve below linear equation using Crammer's Rule.

$$\begin{aligned} X + 2y &= 5 \\ 2y + z &= 7 \\ x + y + z &= 6 \end{aligned}$$
- (2) Explain Properties of Determinants.

Question: 2 (A) Answer the following questions.

03

- (1) Define Unit matrix.
- (2) Define null matrix.
- (3) Write down formula for inverse of matrix.

Question: 2 (B) Answer the following question. (Any two)

06

- (1) Properties of Matrix Addition.
- (2) Explain Adjoint of Matrix.
- (3) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 \\ 4 & 5 \end{bmatrix}$ then find $A'+B'$, BA
- (4) Find $(AB)^{-1}$ if $A^{-1} = \begin{bmatrix} 7 & 6 \\ 1 & 1 \end{bmatrix}$ and $B^{-1} = \begin{bmatrix} 4 & 3 \\ 1 & 1 \end{bmatrix}$

Question: 2 (C) Answer the following question. (Any one)

05

- (1) if $2A - B = \begin{bmatrix} 8 & 11 \\ 8 & 7 \end{bmatrix}$ and $3A - B = \begin{bmatrix} 17 & 19 \\ 12 & 8 \end{bmatrix}$ then find $4A - 3B = ?$
- (2) Explain properties of Inverse Matrix.

- Question: 3 (A) Answer the following questions.** **03**
- (1) Write down formula of distance (d) = _____.
 - (2) Define parallel line.
 - (3) Define Equivalent set.
- Question: 3 (B) Answer the following question. (Any two)** **06**
- (1) If $A = \{ 1, 2, 3 \}$ and $B = \{ 4, 5 \}$ then find $A \times B$.
 - (2) Find the distance between the points A (-2 , -5) and B (3 , -6).
 - (3) Write down demorgan's Law.
 - (4) The distance between two points (K , -5) and (2 , K) is 13. Find the value of K.
- Question: 3 (C) Answer the following question. (Any one)** **05**
- (1) In a group of 50 people, 32 speak Gujarati , 27 speak both and all the people speak at least one or more language. Find the no of people who speak only Gujarati and not English.
 - (2) Show that the quadrilateral with vertices (2 , -1) , (3 , 4) , (-3 , 2) & (-4 , -1) is a rhombus.
- Question: 4 (A) Answer the following questions.** **03**
- (1) The median of observation 35, 10, 28, 8, 24, 5, 20, 19, 12, 30, 39 = _____.
 - (2) What is Mode?
 - (3) Z (Mode) = _____
- Question: 4 (B) Answer the following question. (Any two)** **06**
- (1) Find out Q1 and Q3 of 4 , 24 , 55 , 15 , 45 , 35.
 - (2) Define range.
 - (3) Explain Merits of Mean.
 - (4) Explain Demerits of Range.
- Question: 4 (C) Answer the following question. (Any one)** **05**
- (1) Mean and S.D. of five value are 4.4 and 2.87 respectively, if three values are 6 , 2 , 1 then find remaining two values.
 - (2) Calculate mean , median and mode from following data.
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|-----------|----------|----------|----------|----------|----------|
| Class | 110 -120 | 120 -130 | 130 -140 | 140 -150 | 150 -160 |
| Frequency | 2 | 5 | 5 | 3 | 1 |
- Question: 5 (A) Answer the following questions.** **03**
- (1) Define sequence.
 - (2) Write the formula for T_n in A.P
 - (3) Full Form of HM.
- Question: 5 (B) Answer the following question. (Any two)** **06**
- (1) The 10th term of an A.P. is $\frac{5}{2}$ and first term is $\frac{19}{4}$. Find the common difference.
 - (2) Obtain the formula of finding n^{th} term of 3 , 5 , 7 , 9 & hence find $T_{149} = ?$
 - (3) Which term will be -4374 in G.P. 2 , 6 , 18 , -54?
 - (4) Which term will be $\frac{1}{1536}$ in A.P. $\frac{1}{3}$, $\frac{1}{6}$, $\frac{1}{12}$?
- Question : 5 (C) Answer the following question. (Any one)** **05**
- (1) Three numbers are in G.P. their sum and product are 28 and 512 respectively find the numbers.
 - (2) Find the sum of the following series.
 $0.5 + 0.55 + 0.555 + 0.5555 + \dots$ up to n terms.
