National Testing Agency

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Algebra and Trigonometry

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Algebra and Trigonometry-1

Section Id :	603489207
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Number of Questions :	100
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Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	603489419
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 60348911257 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Consider the sets A={1, 2, 3} and B={a, b}. Then the number of relations from A to B is _____

1. 6^2
2. 6
3. 12
4. 2^6

Options :

60348942833. 1

60348942834. 2

60348942835. 3

60348942836. 4

Question Number : 2 Question Id : 60348911258 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given A = {1,2,3} and B = {1,2} and a R = {(2, 1), (3, 1), (3, 2)} from A to B. Which following zero-one matrix represents R?

1. $\begin{bmatrix} 0 & 0 \\ 1 & 0 \\ 1 & 1 \end{bmatrix}$
2. $\begin{bmatrix} 1 & 0 \\ 1 & 0 \\ 1 & 1 \end{bmatrix}$
3. $\begin{bmatrix} 1 & 0 \\ 1 & 1 \\ 1 & 1 \end{bmatrix}$
4. $\begin{bmatrix} 1 & 1 \\ 1 & 0 \\ 1 & 1 \end{bmatrix}$

Options :

60348942837. 1

60348942838. 2

60348942839. 3

60348942840. 4

Question Number : 3 Question Id : 60348911259 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let the relations R and S be represented by the matrices

$$M_R = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix} \text{ and } M_S = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$$

Which of the following matrices representing $R \cup S$ and $R \cap S$?

1. $M_{R \cup S} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ and $M_{R \cap S} = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
2. $M_{R \cup S} = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ and $M_{R \cap S} = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
3. $M_{R \cup S} = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 1 & 1 & 0 \end{bmatrix}$ and $M_{R \cap S} = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
4. $M_{R \cup S} = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ and $M_{R \cap S} = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

Options :

60348942841. 1

60348942842. 2

60348942843. 3

60348942844. 4

Question Number : 4 Question Id : 60348911260 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Consider the set of words W ={ sheet, last, sky, wash, wind, sit }. If R is the equivalence relation defined by "has the same number of letters". Then

1. W / R = [{sheet,wind}, {last,wash}, {sky,sit}]
2. W / R = [{sheet}, {last,wash,wind}, {sky}]
3. W / R = [{sheet}, {wash}, {sit}]
4. W / R = [{sheet}, {last,wash,wind}, {sky,sit}]

Options :

60348942845. 1

60348942846. 2

60348942847. 3

60348942848. 4

Question Number : 5 Question Id : 60348911261 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let $f: \mathbb{R} \to \mathbb{R}$ be defined by $f(x) = 2x - 3$. Then f^{-1} is given by the formula _____.

1. $f^{-1}(x) = \frac{2}{x-3}$
2. $f^{-1}(x) = \frac{2}{x+3}$
3. $f^{-1}(x) = \frac{x-3}{2}$
4. $f^{-1}(x) = \frac{x+3}{2}$

Options :

60348942849. 1

60348942850. 2

60348942851. 3

60348942852. 4

Question Number : 6 Question Id : 60348911262 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following relation R on A={1,2,3} is transitive but RUR^{-1} is not transitive.

1. R={(1,1)}
2. R={(1,2)}
3. R={(1,2), (2,1), (1, 1), (2,2)}
4. R={(1,2), (1, 1), (2,2)}

Options :

60348942853. 1

60348942854. 2

60348942855. 3

60348942856. 4

Question Number : 7 Question Id : 60348911263 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

With n=12, in J_n, $[7]_{12}+[9]_{12}=$ _____.

1. $[16]_{12}$
2. $[4]_{12}$
3. $[28]_{12}$
4. All of the above options are true.

Options :

60348942857. 1

60348942858. 2

60348942859. 3

60348942860. 4

Question Number : 8 Question Id : 60348911264 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The total number of injective mappings from a set with m elements to a set with n elements, m≤n, is_____.

1. n^m
2. m^n
3. n!
4. $\frac{n!}{(n-m)!}$

Options :

60348942861. 1

60348942862. 2

60348942863. 3

60348942864. 4

Question Number : 9 Question Id : 60348911265 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Consider the relation R from A={1, 2, 3} to
B={x, y, z} given by R={(1, x), (2, y), (3, z)}. Then R^{-1} is the relation from B to A given by _____

1. R^{-1}={(x, 1), (y, 2), (z, 3)}
2. R^{-1}={(x, 1), (z, 3)}
3. R^{-1}={(x, 1), (y, 2)}
4. None of these

Options :

60348942865. 1

60348942866. 2

60348942867. 3

60348942868. 4

Question Number : 10 Question Id : 60348911266 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $f: R - \{3\} \to R$ is defined by $f(x) = \frac{x-2}{x-3}$, then the inverse f^{-1} is _____.

1. $f^{-1}(x) = \frac{2+3x}{1-x}$
2. $f^{-1}(x) = \frac{1-x}{2-3x}$
3. $f^{-1}(x) = \frac{2-3x}{1-x}$
4. None of these

Options :

60348942869. 1

60348942870. 2

60348942871. 3

60348942872. 4

Question Number : 11 Question Id : 60348911267 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The universal relation on a set A is _____

1. A
2. $A \times A$
3. Φ
4. None of these

Options :

60348942873. 1

60348942874. 2

60348942875. 3

60348942876. 4

Question Number : 12 Question Id : 60348911268 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

With n=12, in $j_n, -[3]_{12}$ =_____.

1. $[-3]_{12}$
2. $[9]_{12}$
3. $[21]_{12}$
4. All of these

Options :

60348942877. 1

60348942878. 2

60348942879. 3

60348942880. 4

Question Number : 13 Question Id : 60348911269 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

R is a relation on a set A such that aRa for every a∈ A. Then R is a _____ relation.

1. Symmetric Relation
2. Transitive Relation
3. Reflexive Relation
4. Equivalence Relation

Options :

60348942881. 1

60348942882. 2

60348942883. 3

60348942884. 4

Question Number : 14 Question Id : 60348911270 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 2 & 3 & 4 \\ 7 & 2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 4 & 1 \\ 3 & 4 & 2 \\ 6 & 1 & 4 \end{bmatrix}$, the AB=_____

1. $\begin{bmatrix} 43 & 24 & 24 \\ 53 & 38 & 19 \end{bmatrix}$
2. $\begin{bmatrix} 10 & 24 & 12 \\ 53 & 37 & 18 \end{bmatrix}$
3. $\begin{bmatrix} 20 & 24 & 12 \\ 53 & 37 & 18 \end{bmatrix}$
4. does not exist as matrix multiplication is not conformable

Options :

60348942885. 1

60348942886. 2

60348942887. 3

60348942888. 4

Question Number : 15 Question Id : 60348911271 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Consider the relation R={(1, 1), (1, 2), (2, 3), (4, 4)} on the set A={1, 2, 3, 4}. Then R is _____

1. reflexive
2. symmetric
3. antisymmetric
4. transitive

Options :

60348942889. 1

60348942890. 2

60348942891. 3

60348942892. 4

Question Number : 16 Question Id : 60348911272 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If A is a n-square non-singular matrix, then

1. $|adj\ A| = |A|^{n-1}$
2. $|adj\ A| = |A|^{n}$
3. $|adj\ A| = |A|^{n+1}$
4. $|adj\ A| = I_n$

Options :

60348942893. 1

60348942894. 2

60348942895. 3

60348942896. 4

Question Number : 17 Question Id : 60348911273 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let R be the following equivalence relation on the set
A={1, 2, 3, 4, 5, 6}:
R={(1, 1), (1, 5), (2, 2), (2, 3), (2, 6), (3, 2), (3, 3), (3, 6), (4,4),
(5, 1), (5, 5), (6, 2), (6, 3), (6, 6)}. Find the equivalence classes of R.

1. [{1,5}, {2,3,6}, {4}]
2. [{1} ,{5}, {2,3,6}, {4}]
3. [{1} ,{3, 5}, {2, 6}, {4}]
4. None of these

Options :

60348942897. 1

60348942898. 2

60348942899. 3

60348942900. 4

Question Number : 18 Question Id : 60348911274 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Inverse of the non-singular diagonal matrix $\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$ is

1. $\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$
2. $\begin{bmatrix} c & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & a \end{bmatrix}$
3. $\begin{bmatrix} 0 & 0 & a \\ 0 & b & 0 \\ c & 0 & 0 \end{bmatrix}$
4. $\begin{bmatrix} \frac{1}{a} & 0 & 0 \\ 0 & \frac{1}{b} & 0 \\ 0 & 0 & \frac{1}{c} \end{bmatrix}$

Options :

60348942901. 1

60348942902. 2

60348942903. 3

60348942904. 4

Question Number : 19 Question Id : 60348911275 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The domain of the real-valued function $f(x) = \sqrt{25 - x^2}$ is _____

1. {x∈R:0≤x≤5}
2. {x∈R:-5≤x≤5}
3. {x∈R:-5≤x≤0}
4. {x∈R:0≤x≤25}

Options :

60348942905. 1

60348942906. 2

60348942907. 3

60348942908. 4

Question Number : 20 Question Id : 60348911276 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If a matrix is of order 3x4 then which of the following is false:

1. it has minors of order 1
2. it has minors of order 2
3. it has minors of order 3
4. it has minors of order 4

Options :

60348942909. 1

60348942910. 2

60348942911. 3

60348942912. 4

Question Number : 21 Question Id : 60348911277 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The remainder obtained upon dividing the sum
1!+2!+3!+4!...+99!+100!
by 12 is _____.

1. 6
2. 7
3. 8
4. 9

Options :

60348942913. 1

60348942914. 2

60348942915. 3

60348942916. 4

Question Number : 22 Question Id : 60348911278 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

It is given that rank of a given 3 x 4 matrix is 2. Then it can be reduced to the normal form given by _____.

1. $\begin{bmatrix}1&0&0&0\\0&1&0&0\\0&0&1&0\\0&0&0&0\end{bmatrix}$
2. $\begin{bmatrix}1&0&0&0\\0&1&0&0\\0&0&0&0\\0&0&0&0\end{bmatrix}$
3. $\begin{bmatrix}1&0&0&0\\0&1&0&0\\0&0&0&0\end{bmatrix}$
4. $\begin{bmatrix}1&0&0&0\\0&1&0&0\\0&0&1&0\end{bmatrix}$

Options :

60348942917. 1

60348942918. 2

60348942919. 3

60348942920. 4

Question Number : 23 Question Id : 60348911279 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The conjugate of the matrix $A = \begin{bmatrix}7+2i & -i\\ 7 & 3-2i\end{bmatrix}$ is _____.

1. $\bar{A} = \begin{bmatrix}7-2i & -i\\ 7 & 3+2i\end{bmatrix}$
2. $\bar{A} = \begin{bmatrix}77-2i & i\\ 7 & 3+2i\end{bmatrix}$
3. $\bar{A} = \begin{bmatrix}7+2i & i\\ 7 & 3+2i\end{bmatrix}$
4. None of these

Options :

60348942921. 1

60348942922. 2

60348942923. 3

60348942924. 4

Question Number : 24 Question Id : 60348911280 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which one of the following is not an elementary matrix?

1. $\begin{bmatrix} 4 & 0 \\ 0 & 1 \end{bmatrix}$
2. $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$
3. $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 8 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
4. $\begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 8 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

Options :

60348942925. 1

60348942926. 2

60348942927. 3

60348942928. 4

Question Number : 25 Question Id : 60348911281 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The cofactor of the element a23 = 6 in the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ is _____.

1. -6
2. 6
3. 5
4. None of these

Options :

60348942929. 1

60348942930. 2

60348942931. 3

60348942932. 4

Question Number : 26 Question Id : 60348911282 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is false.

1. Two m x n matrices A and B are equivalent if and only if they have the same rank.
2. Two m x n matrices A and B are equivalent if and only if they have the same normal form matrix.
3. Two m x n matrices A and B are equivalent if and only if they have the same reduced row echelon matrix.
4. Two m x n matrices A and B are equivalent if and only if they can be reduced to the same identity matrix.

Options :

60348942933. 1

60348942934. 2

60348942935. 3

60348942936. 4

Question Number : 27 Question Id : 60348911283 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If A is an orthogonal matrix, then _____

1. $|A| = 0$
2. $|A| = -1$
3. $|A| = 1$
4. $|A| = \pm 1$

Options :

60348942937. 1

60348942938. 2

60348942939. 3

60348942940. 4

Question Number : 28 Question Id : 60348911284 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If A is a non-zero m x 1 column matrix and B is a 1 x m non-zero row matrix, then rank(AB) = _____

1. 1
2. 0
3. 2
4. min{m, n}

Options :

60348942941. 1

60348942942. 2

60348942943. 3

60348942944. 4

Question Number : 29 Question Id : 60348911285 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \end{bmatrix}$ is _____

1. 0
2. 1
3. 2
4. 3

Options :

60348942945. 1

60348942946. 2

60348942947. 3

60348942948. 4

Question Number : 30 Question Id : 60348911286 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick the true statement.

1. The equation AX=0 possesses a non-trivial solution if and only if A is a singular matrix.
2. The equation AX=0 possesses a non-trivial solution if and only if A is a non-singular matrix.
3. The equation AX=0 possesses a trivial solution if and only if A is a singular matrix.
4. The equation AX=0 possesses a trivial solution if and only if A is a non-singular matrix.

Options :

60348942949. 1

60348942950. 2

60348942951. 3

60348942952. 4

Question Number : 31 Question Id : 60348911287 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which one of the following is false.

1. Interchange of a pair of columns does not change the rank.
2. Multiplication of the elements of a column by any non-zero number does not change the rank.
3. Addition to the elements of a column the product by any number k of the corresponding elements of any other column does not change the rank.
4. None of these

Options :

60348942953. 1

60348942954. 2

60348942955. 3

60348942956. 4

Question Number : 32 Question Id : 60348911288 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The inverse of the matrix $A = \begin{bmatrix} 3 & -3 & 1 \\ -2 & 2 & -1 \\ -4 & 5 & -2 \end{bmatrix}$ is

_____

1. $A^{-1} = \begin{bmatrix} 1 & -1 & 1 \\ 0 & -2 & 1 \\ -2 & -3 & 0 \end{bmatrix}$
2. $A^{-1} = \begin{bmatrix} -1 & 1 & 1 \\ 0 & -2 & 1 \\ -2 & -3 & 0 \end{bmatrix}$
3. $A^{-1} = \begin{bmatrix} -1 & 1 & 1 \\ 1 & -2 & 1 \\ -2 & -3 & 0 \end{bmatrix}$
4. $A^{-1} = \begin{bmatrix} -1 & 1 & 1 \\ -1 & -2 & 1 \\ -2 & -3 & 0 \end{bmatrix}$

Options :

60348942957. 1

60348942958. 2

60348942959. 3

60348942960. 4

Question Number : 33 Question Id : 60348911289 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

It is given that rank of the matrix $A = \begin{bmatrix} 2 & -2 & 0 & 6 \\ 4 & 2 & 0 & 2 \\ 1 & -1 & 0 & 3 \\ 1 & -2 & 1 & 2 \end{bmatrix}$ is 3. Then its equivalent normal form is _____.

1. $\begin{bmatrix} I_2 & 0 \\ 0 & 0 \end{bmatrix}$
2. $\begin{bmatrix} I_3 & 0 \\ 0 & 0 \end{bmatrix}$
3. $\begin{bmatrix} I_4 & 0 \\ 0 & 0 \end{bmatrix}$
4. $\begin{bmatrix} I_1 & 0 \\ 0 & 0 \end{bmatrix}$

Options :

60348942961. 1

60348942962. 2

60348942963. 3

60348942964. 4

Question Number : 34 Question Id : 60348911290 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The elementary matrix $E_{31}(k)$ obtained from the 3-square identity matrix is _____

1. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & k \end{bmatrix}$
2. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ k & 0 & 1 \end{bmatrix}$
3. $\begin{bmatrix} k & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$
4. None of these

Options :

60348942965. 1

60348942966. 2

60348942967. 3

60348942968. 4

Question Number : 35 Question Id : 60348911291 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The normal form of the matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 0 & 2 \\ 2 & 1 & -3 \end{bmatrix}$ is_____

1. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$
2. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
3. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$
4. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Options :

60348942969. 1

60348942970. 2

60348942971. 3

60348942972. 4

Question Number : 36 Question Id : 60348911292 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which one of the following non -homogeneous system of equations is consistent?

1. 2x+3y=8; 2x+3y=5
2. 2x+3y=5; 4x+6y=-1
3. 2x+3y=5; 4x+6y=10
4. 2x+3y=5; 4x+6y=5

Options :

60348942973. 1

60348942974. 2

60348942975. 3

60348942976. 4

Question Number : 37 Question Id : 60348911293 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is not in row echelon form.

1. $\begin{bmatrix} 0 & 2 & 1 \\ 0 & 0 & 2 \\ 0 & 0 & 0 \end{bmatrix}$
2. $\begin{bmatrix} 1 & 3 & 1 & 0 \\ 0 & 4 & 3 & 3 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
3. $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 5 & 3 & 2 \\ 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 7 \end{bmatrix}$
4. $\begin{bmatrix} 0 & 3 & 1 \\ 0 & 0 & 2 \\ 5 & 0 & 0 \end{bmatrix}$

Options :

60348942977. 1

60348942978. 2

60348942979. 3

60348942980. 4

Question Number : 38 Question Id : 60348911294 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If an *nxn* matrix A is reduced to echelon form C and C has a zero row, then the homogenous system AX = 0 has a _____.

1. nontrivial solution
2. only the trivial sol
3. only one nontrivial solu
4. none of these

Options :

60348942981. 1

60348942982. 2

60348942983. 3

60348942984. 4

Question Number : 39 Question Id : 60348911295 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The inverse of the matrix $A = \begin{bmatrix} 7 & 2 & 1 \\ 0 & 3 & -1 \\ -3 & 4 & -2 \end{bmatrix}$ is _____

1. $A^{-1} = \begin{bmatrix} -2 & 8 & -5 \\ 3 & -11 & 7 \\ 9 & -34 & 21 \end{bmatrix}$
2. $A^{-1} = \begin{bmatrix} -2 & 8 & -5 \\ 13 & -21 & 17 \\ 9 & -34 & 21 \end{bmatrix}$
3. $A^{-1} = \begin{bmatrix} -2 & 8 & -5 \\ 3 & -11 & 7 \\ 19 & -4 & 20 \end{bmatrix}$
4. $A^{-1} = \begin{bmatrix} 2 & -8 & -5 \\ 3 & -11 & 7 \\ 9 & -34 & 21 \end{bmatrix}$

Options :

60348942985. 1

60348942986. 2

60348942987. 3

60348942988. 4

Question Number : 40 Question Id : 60348911296 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The eigen values of the matrix $A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & 2 \\ -1 & 1 & 3 \end{bmatrix}$ are

_____

1. 1, 3, 3
2. 1, 2, 3
3. 1, 3, 5
4. 1, 4, 6

Options :

60348942989. 1

60348942990. 2

60348942991. 3

60348942992. 4

Question Number : 41 Question Id : 60348911297 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The elementary matrix $E_{13}(k)$ obtained from the 4-square identity matrix is _____

1. $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & k & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
2. $\begin{bmatrix} 1 & 0 & k & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
3. $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & k & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
4. None of these

Options :

60348942993. 1

60348942994. 2

60348942995. 3

60348942996. 4

Question Number : 42 Question Id : 60348911298 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Characteristic vectors corresponding to distinct characteristic roots of a real symmetric matrix are_____.

1. the same
2. one is a scalar multiple of the other
3. orthogonal
4. none of these

Options :

60348942997. 1

60348942998. 2

60348942999. 3

60348943000. 4

Question Number : 43 Question Id : 60348911299 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Suppose we have to multiply second row of a 3 x 3 matrix by 100. Then the elementary matrix that we need is

1. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 100 \end{bmatrix}$
2. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 100 & 0 \\ 0 & 0 & 1 \end{bmatrix}$
3. $\begin{bmatrix} 100 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$
4. None of these

Options :

60348943001. 1

60348943002. 2

60348943003. 3

60348943004. 4

Question Number : 44 Question Id : 60348911300 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In a field F, if a, b∈F such that $a^2=b^2$, then_____

1. either a=b or a=-b
2. either a=0 or a=-b
3. either a=b or a=0
4. None of these

Options :

60348943005. 1

60348943006. 2

60348943007. 3

60348943008. 4

Question Number : 45 Question Id : 60348911301 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If ρ(A) denotes the rank of a matrix A, then ρ(AB) is equal to _____

1. ρ(A)
2. ρ(B)
3. less than or equal to min{ρ(A), ρ(B)}
4. greater than min{ρ(A), ρ(B)}

Options :

60348943009. 1

60348943010. 2

60348943011. 3

60348943012. 4

Question Number : 46 Question Id : 60348911302 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & 2 \\ -1 & 1 & 3 \end{bmatrix}$, then _____.

1. A^3-6A^2+11A-6I=0 , where 0 is the 3-square zero matrix.
2. A^3-6A^2+11A-8I=0, where 0 is the 3-square zero matrix.
3. A^3-6A^2+7A-6I=0 , where 0 is the 3-square zero matrix.
4. A^3-8A^2+11A-6I=0, where 0 is the 3-square zero matrix.

Options :

60348943013. 1

60348943014. 2

60348943015. 3

60348943016. 4

Question Number : 47 Question Id : 60348911303 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following non-homogeneous system of equations is not consistent?

1. 2x + 3y = 5; 2x + 3y = 7
2. 2x + 3y = 5; 2x - 3y =-1
3. 2x + 3y = 5; 4x + 6y = 10
4. 2x + 3y = 5; 3x + 2 y = 7

Options :

60348943017. 1

60348943018. 2

60348943019. 3

60348943020. 4

Question Number : 48 Question Id : 60348911304 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The cubic equation with rational coefficients whose roots are 1 and $3-\sqrt{-2}$ is given by ____

1. $x^3+7x^2+17x-11=0$
2. $x^3-7x^2+17x+11=0$
3. $x^3-7x^2+17x-11=0$
4. $x^3+7x^2+17x+11=0$

Options :

60348943021. 1

60348943022. 2

60348943023. 3

60348943024. 4

Question Number : 49 Question Id : 60348911305 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Consider the m × n homogeneous linear system AX = 0, where M = [A 0] is the augmented matrix then_____

1. rank (A) < rank (M)
2. rank (A) > rank (M)
3. rank (A) = rank (M)
4. none of these

Options :

60348943025. 1

60348943026. 2

60348943027. 3

60348943028. 4

Question Number : 50 Question Id : 60348911306 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

3 is a double root of the equation $8x^3-47x^2+66x+9=0$. Third root is _____

1. $-\frac{1}{8}$
2. $\frac{1}{8}$
3. 8
4. -8

Options :

60348943029. 1

60348943030. 2

60348943031. 3

60348943032. 4

Question Number : 51 Question Id : 60348911307 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The eigen values of the matrix $\begin{bmatrix} 3 & 0 & 0 \\ 5 & 4 & 0 \\ 3 & 6 & 1 \end{bmatrix}$ are_____

1. 3, 3, 3
2. 1, 3, 4
3. 3, 3, 5
4. 0, 4, 6

Options :

60348943033. 1

60348943034. 2

60348943035. 3

60348943036. 4

Question Number : 52 Question Id : 60348911308 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given that the roots of $x^4-10x^3-120x^2+320x+1024=0$ are real and that they are in geometric progression. The roots are_____

1. -2, 4, -8, 16
2. 2, 4, 8, 16
3. 2, -4, 8, -16
4. None of the above options

Options :

60348943037. 1

60348943038. 2

60348943039. 3

60348943040. 4

Question Number : 53 Question Id : 60348911309 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Fill in the blanks: If λ is a characteristic root of a nonsingular matrix A, then _____ is a characteristic root of adj A.

1. $\lambda|A|$
2. $\frac{|A|}{\lambda}$
3. $\lambda + |A|$
4. $\lambda - |A|$

Options :

60348943041. 1

60348943042. 2

60348943043. 3

60348943044. 4

Question Number : 54 Question Id : 60348911310 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let V be the set of all vectors in a plane. Then which of the following is not a binary operation on V.

1. vector addition
2. vector subtraction
3. cross product of vectors
4. None of these

Options :

60348943045. 1

60348943046. 2

60348943047. 3

60348943048. 4

Question Number : 55 Question Id : 60348911311 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following matrix satisfies its characteristic equation?

1. $\begin{bmatrix} 2 & 1 & 1 \\ 3 & -1 & 3 \\ 2 & -1 & 1 \end{bmatrix}$
2. $\begin{bmatrix} \sqrt{2} & 10 \\ 3 & -1 \end{bmatrix}$
3. $\begin{bmatrix} 3 & -1 & 1 \\ -1 & -1 & 0 \\ 2 & 0 & -1 \end{bmatrix}$
4. All of these

Options :

60348943049. 1

60348943050. 2

60348943051. 3

60348943052. 4

Question Number : 56 Question Id : 60348911312 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following binary structure is isomorphic to $\mathbb{Z}$ under usual addition.

1. 100 $\mathbb{Z}$ under usual addition.
2. $\mathbb{Z}$ under multiplication
3. $\langle \mathbb{Z}_4, +_3 \rangle$
4. $\langle \mathbb{Z}_4, x_4 \rangle$

Options :

60348943053. 1

60348943054. 2

60348943055. 3

60348943056. 4

Question Number : 57 Question Id : 60348911313 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The equation with rational coefficients, one of whose roots is $\sqrt{5} + \sqrt{2}$ is given by ____

1. $x^4 + 14x^2 + 9 = 0$
2. $x^4 - 14x^2 + 9 = 0$
3. $x^4 - 14x^2 - 9 = 0$
4. $x^4 + 14x^2 - 9 = 0$

Options :

60348943057. 1

60348943058. 2

60348943059. 3

60348943060. 4

Question Number : 58 Question Id : 60348911314 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following set of invertible n x n matrices with real entries is a subgroup of GL(n, R), the multiplicative group of invertible n x n matrices with real entries

1. The n x n matrices with determinant 1 and the operation matrix multiplication
2. The n x n matrices with determinant $\frac{1}{2}$ and the operation matrix multiplication
3. The n x n matrices with determinant 2 and the operation matrix addition
4. The n x n matrices with determinant 2 and the operation matrix multiplication

Options :

60348943061. 1

60348943062. 2

60348943063. 3

60348943064. 4

Question Number : 59 Question Id : 60348911315 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Find out the false statement

1. If , $\alpha, \beta, \gamma, \cdots$ are the roots of $f(x) = 0$, then the roots of the equation $f(-x) = 0$ are $-\alpha, -\beta, -\gamma, \cdots$
2. If $a_1, a_2, \cdots, a_n$ are the roots of the equation $a_0 x^n + a_1 x^{n-1} + \cdots + a_{n-1} x + a = 0$ then $\sum a_1 a_2 = \frac{a_2}{a_0}$
3. If $a_1, a_2, \cdots, a_n$ are the roots of the equation $x^n + p_1 x^{n-1} + p_2 x^{n-2} + \cdots + p_n = 0$, then $a_1 + a_2 + \cdots + a_n = -p_1$
4. If $a_1, a_2, \cdots, a_n$ are the roots of the equation $x^n + p_1 x^{n-1} + p_2 x^{n-2} + \cdots + p_n = 0$, then $a_1 + a_2 + \cdots + a_n = p_1$

Options :

60348943065. 1

60348943066. 2

60348943067. 3

60348943068. 4

Question Number : 60 Question Id : 60348911316 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true.

1. Every group of order ≤ 4 is cyclic
2. There is at least one abelian group of every finite order >0
3. All generators of $\mathbb{Z}_{20}$ are prime numbers
4. If G and G' are groups then G∩G' is a group

Options :

60348943069. 1

60348943070. 2

60348943071. 3

60348943072. 4

Question Number : 61 Question Id : 60348911317 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If , α, β, γ re roots of $x^3 + px^2 + qx + r = 0$, then $\sum \frac{1}{\alpha}$ =----------

1. qr
2. $\frac{q}{r}$
3. $-\frac{q}{r}$
4. $-\frac{r}{q}$

Options :

60348943073. 1

60348943074. 2

60348943075. 3

60348943076. 4

Question Number : 62 Question Id : 60348911318 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of elements in the set $\{\sigma \epsilon S_5 | \sigma(2) = 5\}$ is ----------

1. 3
2. 4
3. 5
4. 24

Options :

60348943077. 1

60348943078. 2

60348943079. 3

60348943080. 4

Question Number : 63 Question Id : 60348911319 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let V be the set of all vectors in space. Then which of the following is not a binary operation on V.

1. vector addition
2. vector subtraction
3. cross product of vectors
4. dot product of vectors

Options :

60348943081. 1

60348943082. 2

60348943083. 3

60348943084. 4

Question Number : 64 Question Id : 60348911320 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The order of $\sigma = (4, 5)(2, 3, 7)$ in S_8 is_____.

1. 2
2. 3
3. 6
4. 8

Options :

60348943085. 1

60348943086. 2

60348943087. 3

60348943088. 4

Question Number : 65 Question Id : 60348911321 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following binary structure is isomorphic to $\langle \mathbb{Z}_4 + +_4 \rangle$

1. $\langle U_4, . \rangle$
2. $\langle \mathbb{Z}_4 + +_3 \rangle$
3. $\langle Z_3, X_3 \rangle$
4. $\langle Z_3, X_4 \rangle$

Options :

60348943089. 1

60348943090. 2

60348943091. 3

60348943092. 4

Question Number : 66 Question Id : 60348911322 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is an automorphism on the set of integers?

1. the trivial homomorphism
2. the identity homomorphism
3. the function that maps each element to 0
4. None of these

Options :

60348943093. 1

60348943094. 2

60348943095. 3

60348943096. 4

Question Number : 67 Question Id : 60348911323 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following subset of the complex numbers is a not subgroup under the operation addition of the group of complex numbers.

1. the set of integers
2. the set of pure imaginary numbers including 0
3. the set$\{\pi^n : n \text{ is an integer}\}$
4. the set of rational multiples of π

Options :

60348943097. 1

60348943098. 2

60348943099. 3

60348943100. 4

Question Number : 68 Question Id : 60348911324 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Consider the set X = {0, 1, 2, 3, 4, 5}. Then X is a ring under _____.

1. addition and multiplication modulo 2
2. addition and multiplication modulo 3
3. addition and multiplication modulo 5
4. addition and multiplication modulo 6

Options :

60348943101. 1

60348943102. 2

60348943103. 3

60348943104. 4

Question Number : 69 Question Id : 60348911325 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which one of the following statements is true.

1. Every cyclic group of order >2 has at least two distinct generators
2. Every abelian group is cyclic
3. The set of rational numbers under addition is a cyclic group
4. Every element of every cyclic group generates the group

Options :

60348943105. 1

60348943106. 2

60348943107. 3

60348943108. 4

Question Number : 70 Question Id : 60348911326 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A division ring contains exactly _____ number of idempotent elements.

1. 1
2. 2
3. 3
4. 4

Options :

60348943109. 1

60348943110. 2

60348943111. 3

60348943112. 4

Question Number : 71 Question Id : 60348911327 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $\mu = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 5 & 2 & 4 & 3 & 1 & 6 \end{pmatrix}$, then μ^{100} = _____

1. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 5 & 2 & 4 & 3 & 1 & 6 \end{pmatrix}$
2. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 1 & 2 & 3 & 4 & 5 & 6 \end{pmatrix}$
3. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 5 & 4 & 3 & 1 & 6 \end{pmatrix}$
4. None of these

Options :

60348943113. 1

60348943114. 2

60348943115. 3

60348943116. 4

Question Number : 72 Question Id : 60348911328 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$\frac{e^{i\theta} - e^{i\theta}}{2i} =$ _____

1. $cos\theta$
2. $sin\theta$
3. $i\ cos\theta$
4. $i\ sin\theta$

Options :

60348943117. 1

60348943118. 2

60348943119. 3

60348943120. 4

Question Number : 73 Question Id : 60348911329 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The order of the cycle (1, 4, 5, 7) in S_8 is_____

1. 1
2. 2
3. 3
4. 4

Options :

60348943121. 1

60348943122. 2

60348943123. 3

60348943124. 4

Question Number : 74 Question Id : 60348911330 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of $(\cos\theta+i\sin\theta)^n$ is _____

1. $\cos n\theta+i \sin n\theta$
2. $\cos n\theta-i \sin n\theta$
3. $n \cos n\theta+i\, n \sin n\theta$
4. $n \cos n\theta+i\, n \sin n\theta$

Options :

60348943125. 1

60348943126. 2

60348943127. 3

60348943128. 4

Question Number : 75 Question Id : 60348911331 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let Z be the group of integers under the operation addition and G={1, -1} be the group under multiplication. Kernel of the homomorphism $\emptyset: Z \to G$ defined by

$\emptyset(n) = \begin{cases} 1, if\ n\ is\ even \\ -1, if\ n\ is\ odd \end{cases}$ is _____

1. the set of integers
2. the set of even integers
3. {1}
4. 1, -1}

Options :

60348943129. 1

60348943130. 2

60348943131. 3

60348943132. 4

Question Number : 76 Question Id : 60348911332 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick the false statement.

1. $\cosh 2x = \cosh^2 x + \sinh^2 x$
2. $\cosh 2x = 1 + 2\sinh^2 x$.
3. $\cosh 2x = 2\cosh^2 x - 1$
4. $\cosh 2x = 2\cosh^2 x + 1$

Options :

60348943133. 1

60348943134. 2

60348943135. 3

60348943136. 4

Question Number : 77 Question Id : 60348911333 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is false.

1. Multiplication in a field is commutative
2. Addition in every ring is commutative
3. Multiplication in every ring is commutative
4. Every element in a ring has an additive inverse

Options :

60348943137. 1

60348943138. 2

60348943139. 3

60348943140. 4

Question Number : 78 Question Id : 60348911334 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of e $\log_e$ (-1) is _____

1. $i\pi$
2. $-\frac{i\pi}{2}$
3. $\frac{\pi}{2}$
4. $-\frac{\pi}{2}$

Options :

60348943141. 1

60348943142. 2

60348943143. 3

60348943144. 4

Question Number : 79 Question Id : 60348911335 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

All the solutions of the equation $x^2 + 2x + 2=0$ in Z_6 are _____

1. 1 and 2
2. 0 and 1
3. 2 and 3
4. None of these

Options :

60348943145. 1

60348943146. 2

60348943147. 3

60348943148. 4

Question Number : 80 Question Id : 60348911336 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The Maclaurin series of $\frac{1}{1+x}$ is _____

1. $1 - x + x^2 - x^3 + x^4 - x^5 + \cdots + (-1)^n x^5 + \cdots$
2. $1 + x + x^2 + x^3 + x^4 + x^5 + \cdots$
3. $1 + x + \frac{x^2}{2} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \cdots$
4. None of these

Options :

60348943149. 1

60348943150. 2

60348943151. 3

60348943152. 4

Question Number : 81 Question Id : 60348911337 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$\frac{e^{i\theta} - e^{i\theta}}{2i} =$ _____

1. $cos\theta$
2. $sin\theta$
3. $i\, cos\theta$
4. $i\, sin\theta$

Options :

60348943153. 1

60348943154. 2

60348943155. 3

60348943156. 4

Question Number : 82 Question Id : 60348911338 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The sum of the series $\sum_{k-1}^{10} n^2$ is _____

1. 530
2. 560
3. 385
4. 480

Options :

60348943157. 1

60348943158. 2

60348943159. 3

60348943160. 4

Question Number : 83 Question Id : 60348911339 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $(\sqrt{3}+i)^6 = x+iy$ then the values of x and y are

1. x = -64, y = 0
2. x = -64, y = 1
3. x = -64, y = 3
4. None of these

Options :

60348943161. 1

60348943162. 2

60348943163. 3

60348943164. 4

Question Number : 84 Question Id : 60348911340 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 1 & 1 & 2 \\ 3 & 1 & 1 \\ 2 & 3 & 1 \end{bmatrix}$, then A-2=_____

1. $\frac{1}{121}\begin{bmatrix} -8 & -24 & 29 \\ 40 & -1 & -24 \\ -27 & 40 & -8 \end{bmatrix}$
2. $\frac{1}{121}\begin{bmatrix} -18 & -24 & 29 \\ 140 & -1 & -24 \\ -27 & 40 & -8 \end{bmatrix}$
3. $\frac{1}{121}\begin{bmatrix} -8 & -24 & 29 \\ 40 & -1 & -24 \\ -27 & 40 & -8 \end{bmatrix}$
4. $\frac{1}{121}\begin{bmatrix} 8 & 24 & -29 \\ 40 & -1 & -24 \\ 27 & -40 & -8 \end{bmatrix}$

Options :

60348943165. 1

60348943166. 2

60348943167. 3

60348943168. 4

Question Number : 85 Question Id : 60348911341 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is false.

1. cos h(x + y)=cosh x cosh y+sinh x sinh y
2. cos h(x - y)=cosh x cosh y-sinh xsinh y
3. sin h(x + y)=sinh x cosh y+cosh x sinh y
4. sin h(x - y)=sinh x cosh y+cosh xsinh

Options :

60348943169. 1

60348943170. 2

60348943171. 3

60348943172. 4

Question Number : 86 Question Id : 60348911342 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The vectors for the matrix A given by $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ are_____

1. Every vector $[k, k, k]^T$ is a characteristic vector of A associated with the characteristic root λ=5 and every vector $[2h+k, -h, -k]^T$ is a characteristic vector of A associated with the characteristic root λ=1
2. Every vector $[k, -k, k]^T$ is a characteristic vector of A associated with the characteristic root λ=5 and every vector $[2h+k, -h, -k]^T$ is a characteristic vector of A associated with the characteristic root λ=1
3. Every vector $[k, k, k]^T$ is a characteristic vector of A associated with the characteristic root λ=5 and every vector $[2h+k, h, -k]^T$ is a characteristic vector of A associated with the characteristic root λ=1
4. Every vector $[k, k, -k]^T$ is a characteristic vector of A associated with the characteristic root λ=5 and every vector $[2h+k, -h, k]^T$ is a characteristic vector of A associated with the characteristic root λ=1

Options :

60348943173. 1

60348943174. 2

60348943175. 3

60348943176. 4

Question Number : 87 Question Id : 60348911343 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of $\log_e i$ is _____

1. $-\frac{i\pi}{2}$
2. $\frac{i\pi}{2}$
3. $\frac{\pi}{2}$
4. $-\frac{\pi}{2}$

Options :

60348943177. 1

60348943178. 2

60348943179. 3

60348943180. 4

Question Number : 88 Question Id : 60348911344 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $(1-i)^{10} = x + iy$ then the values of x and y are

1. x = 1, y = -32
2. x = 0, y = -32
3. x = 0, y = 32
4. None of these

Options :

60348943181. 1

60348943182. 2

60348943183. 3

60348943184. 4

Question Number : 89 Question Id : 60348911345 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The Maclaurin series of log(1+ x) is_____

1. $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5} - \cdots$
2. $-x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5} - \cdots$
3. $x + \frac{x^2}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \frac{x^5}{5} - \cdots$
4. $-x - \frac{x^2}{2} - \frac{x^3}{3} - \frac{x^4}{4} - \frac{x^5}{5} - \cdots$

Options :

60348943185. 1

60348943186. 2

60348943187. 3

60348943188. 4

Question Number : 90 Question Id : 60348911346 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$log_e 1 =$ _____

1. 0
2. -iπ
3. π
4. -π

Options :

60348943189. 1

60348943190. 2

60348943191. 3

60348943192. 4

Question Number : 91 Question Id : 60348911347 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$\sum_{k=1}^{100} K =$ _____

1. 5050
2. 5000
3. 5500
4. None of these

Options :

60348943193. 1

60348943194. 2

60348943195. 3

60348943196. 4

Question Number : 92 Question Id : 60348911348 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let ϕ :G→G' be a group homomorphism of G onto G' If G is abelian, then G' is _____

1. cyclic
2. not cyclic
3. abelian
4. a non-commutative group

Options :

60348943197. 1

60348943198. 2

60348943199. 3

60348943200. 4

Question Number : 93 Question Id : 60348911349 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In a field F, if a, b ∈ F such that $a^2=b^2$, then_____

1. either a = b or a = -b
2. either a = 0 or a = -b
3. either a = b or a = 0
4. None of these

Options :

60348943201. 1

60348943202. 2

60348943203. 3

60348943204. 4

Question Number : 94 Question Id : 60348911350 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If * is a binary operation on a set S, an element x of S is an idempotent for * if x * x = x. A group G has

1. exactly one idempotent element
2. two idempotent elements
3. three idempotent elements
4. no idempotent element

Options :

60348943205. 1

60348943206. 2

60348943207. 3

60348943208. 4

Question Number : 95 Question Id : 60348911351 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A Gaussian integer is a complex number a + i b, with a and b being integers. The set of Gaussian integers is a_____

1. commutative ring with no unity
2. ring with unity, but not commutative
3. ring that is neither commutative nor has a unity
4. commutative ring with unity

Options :

60348943209. 1

60348943210. 2

60348943211. 3

60348943212. 4

Question Number : 96 Question Id : 60348911352 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In S_6, the cycle (1, 5) denotes the permutation

1. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 5 & 3 & 4 & 1 & 6 \end{pmatrix}$
2. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 5 & 2 & 3 & 4 & 1 & 6 \end{pmatrix}$
3. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 5 & 2 & 3 & 4 & 6 & 1 \end{pmatrix}$
4. $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 4 & 2 & 3 & 5 & 1 & 6 \end{pmatrix}$

Options :

60348943213. 1

60348943214. 2

60348943215. 3

60348943216. 4

Question Number : 97 Question Id : 60348911353 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$, then A^{20}=_____

1. $\begin{bmatrix} 1 & 0 & 0 \\ 10 & 10 & 0 \\ 10 & 0 & 1 \end{bmatrix}$
2. $\begin{bmatrix} 1 & 0 & 0 \\ -10 & 1 & 0 \\ -10 & 0 & 1 \end{bmatrix}$
3. $\begin{bmatrix} -1 & 1 & 10 \\ 10 & 1 & 0 \\ 10 & 0 & 1 \end{bmatrix}$
4. $\begin{bmatrix} 1 & 0 & 0 \\ 10 & 1 & 0 \\ 10 & 0 & 1 \end{bmatrix}$

Options :

60348943217. 1

60348943218. 2

60348943219. 3

60348943220. 4

Question Number : 98 Question Id : 60348911354 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The roots of the reciprocal equation $60x^4 - 736x^3 + 1433x^2 - 736x + 60 = 0$ are_____

1. $\frac{2}{7}, \frac{7}{2}, 10, \frac{1}{10}$
2. $\frac{2}{3}, \frac{3}{2}, -10, -\frac{1}{10}$
3. $-\frac{2}{3}, -\frac{3}{2}, 10, \frac{1}{10}$
4. $\frac{2}{3}, \frac{3}{2}, 10, \frac{1}{10}$

Options :

60348943221. 1

60348943222. 2

60348943223. 3

60348943224. 4

Question Number : 99 Question Id : 60348911355 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The characteristic vectors of the matrix $A = \begin{bmatrix} a & h & g \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$ are _____

1. the characteristic vector corresponding to the root λ=a is $\begin{bmatrix} k_1 \\ 0 \\ 0 \end{bmatrix}$ (where k_1 is arbitrary), the characteristic vector corresponding to the root λ=b is $\begin{bmatrix} k_2 \\ \frac{b}{h}k_2 \\ 0 \end{bmatrix}$ (k_2 is arbitrary) and the characteristic vector corresponding to the root λ=c is $\begin{bmatrix} k_3 \\ 0 \\ \frac{(c-a)}{g}k_3 \end{bmatrix}$ (k_3 is arbitrary)
2. the characteristic vector corresponding to the root λ=a is $\begin{bmatrix} k_1 \\ 0 \\ 0 \end{bmatrix}$ (where k_1 is arbitrary), the characteristic vector corresponding to the root λ=b is $\begin{bmatrix} k_2 \\ \frac{(b-a)}{h}k_2 \\ 0 \end{bmatrix}$ (k_2 is arbitrary) to the root λ=c is $\begin{bmatrix} k_3 \\ 0 \\ \frac{c}{g}k_3 \end{bmatrix}$ (k_3 is arbitrary)
3. the characteristic vector corresponding to the root λ=a is $\begin{bmatrix} k_1 \\ 0 \\ 0 \end{bmatrix}$ (where k_1 is arbitrary), the characteristic vector corresponding to the root λ=b is $\begin{bmatrix} k_2 \\ \frac{b}{h}k_2 \\ 0 \end{bmatrix}$ (k_2 is arbitrary) and the characteristic vector corresponding to the root λ=c is $\begin{bmatrix} k_3 \\ 0 \\ \frac{c}{g}k_3 \end{bmatrix}$ (k_3 is arbitrary)
4. the characteristic vector corresponding to the root λ=a is $\begin{bmatrix} k_1 \\ 0 \\ 0 \end{bmatrix}$ (where 1 k is arbitrary), the characteristic vector corresponding to the root λ=b is $\begin{bmatrix} k_2 \\ \frac{(b-a)}{h}k_2 \\ 0 \end{bmatrix}$ (k_2 is arbitrary) and the root λ=c is $\begin{bmatrix} k_3 \\ 0 \\ \frac{(c-a)}{g}k_3 \end{bmatrix}$ (k_3 is arbitrary)

Options :

60348943225. 1

60348943226. 2

60348943227. 3

60348943228. 4

Question Number : 100 Question Id : 60348911356 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If α, β, γ are the roots of the equation $x^3-px^2+qx-r=0$, then the value of $\frac{1}{\alpha^2}+\frac{1}{\beta^2}+\frac{1}{\gamma^2}$ is _____

1. $\frac{q^2+2pr}{r^2}$
2. $\frac{-q^2-2pr}{r^2}$
3. $\frac{q^2-2pr}{r^2}$
4. $\frac{-q^2+2pr}{r^2}$

Options :

60348943229. 1

60348943230. 2

60348943231. 3

60348943232. 4