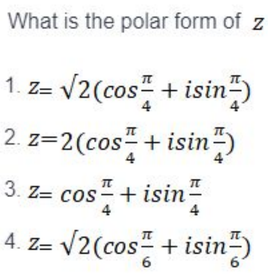
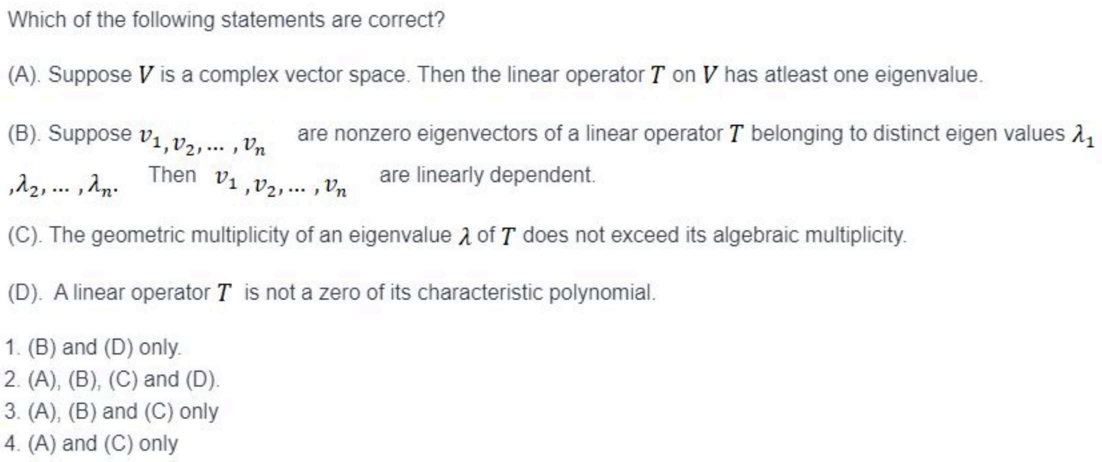
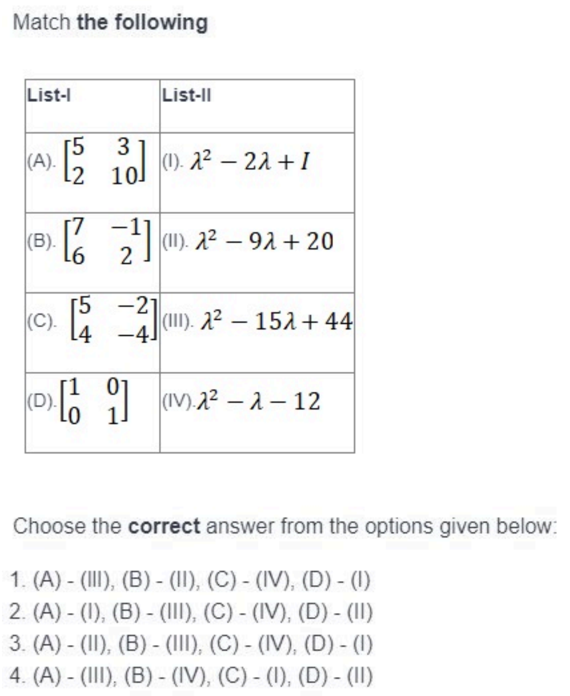
PREVIEW QUESTION BANK

Module Name : cec24-ma02 Algebra-ENG
Exam Date : 18-May-2024 Batch : 09:00-12:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	14121001	 What is the polar form of $z = 1 + i$? 1. z= $\sqrt{2}(cos\frac{\pi}{4} + isin\frac{\pi}{4})$ 2. z=$2(cos\frac{\pi}{4} + isin\frac{\pi}{4})$ 3. z= $cos\frac{\pi}{4} + isin\frac{\pi}{4}$ 4. z= $\sqrt{2}(cos\frac{\pi}{6} + isin\frac{\pi}{6})$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
2	14121002	 Which of the following statements are correct? (A). Suppose V is a complex vector space. Then the linear operator T on V has atleast one eigenvalue. (B). Suppose $v_1, v_2, \dots , v_n$ are nonzero eigenvectors of a linear operator T belonging to distinct eigen values λ_1 ,$\lambda_2, \dots , \lambda_n$. Then $v_1 , v_2, \dots , v_n$ are linearly dependent. (C). The geometric multiplicity of an eigenvalue λ of T does not exceed its algebraic multiplicity. (D). A linear operator T is not a zero of its characteristic polynomial. 1. (B) and (D) only. 2. (A), (B), (C) and (D). 3. (A), (B) and (C) only 4. (A) and (C) only A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
3	14121003		1.0	0.00



Match **the following**

List-I	**List-II**
(A). $\begin{bmatrix} 5 & 3 \\ 2 & 10 \end{bmatrix}$	(I). $\lambda^2 - 2\lambda + I$
(B). $\begin{bmatrix} 7 & -1 \\ 6 & 2 \end{bmatrix}$	(II). $\lambda^2 - 9\lambda + 20$
(C). $\begin{bmatrix} 5 & -2 \\ 4 & -4 \end{bmatrix}$	(III). $\lambda^2 - 15\lambda + 44$
(D). $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$	(IV). $\lambda^2 - \lambda - 12$

Choose the **correct** answer from the options given below:

1. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
2. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
3. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

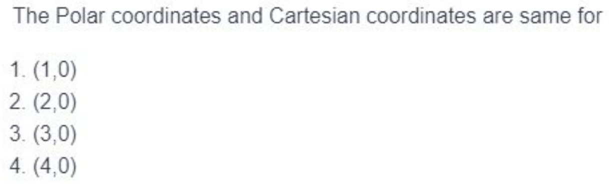
A2 : 2

A3 : 3

A4 : 4

Objective Question

4 14121004 1.0 0.00



The Polar coordinates and Cartesian coordinates are same for

1. (1,0)
2. (2,0)
3. (3,0)
4. (4,0)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

5 14121005 1.0 0.00

The function $f: C/\{0\} \to C$ such that $f(z) = \arg z$ is a

1. Single valued function
2. Multivalued function
3. Continuous function
4. Differentiable

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

6 14121006 1.0 0.00

Let $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, f(\lambda) = 2\lambda^2 - 3\lambda + 5 \; and \; g(\lambda) = \lambda^2 - 5\lambda - 2.$

List-I	**List-II**
(A). $\lvert A \rvert$	(I). $\begin{bmatrix} 7 & 10 \\ 15 & 22 \end{bmatrix}$
(B). $f(A)$	(II). -2
(C). $g(A)$	(III). $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$
(D). A^2	(IV). $\begin{bmatrix} 16 & 14 \\ 21 & 37 \end{bmatrix}$

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
2. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)
3. (A) - (III), (B) - (I), (C) - (IV), (D) - (II)
4. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

7 14121007 1.0 0.00

Let $D_k = kI$; where k is a scalar, then which of the following options are correct?

(A). $D_k A = kA$

(B). $BD_k = kB$

(C). $D_k + D_{k'} = D_{kk'}$

(D). $D_k D_{k'} = D_{k+k'}$

Choose the ***correct*** answer from the options given below:

1. (A) and (D) only
2. (B) and (D) only.
3. (A) and (B) only
4. (A), (C) and (D) only.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

8 14121008 1.0 0.00

Convert the rectangular or Cartesian coordinate (2,2) into polar coordinate.

1. $(2,\frac{\pi}{3})$
2. $(2\sqrt{2},\frac{\pi}{4})$
3. $(2\sqrt{2},\frac{\pi}{3})$
4. $(2,\frac{\pi}{4})$

A1 : 1

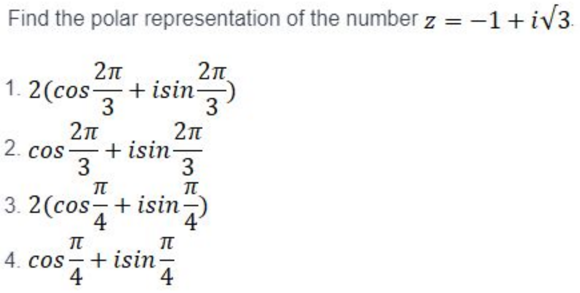
A2 : 2

A3 : 3

A4 : 4

Objective Question

9 14121009 1.0 0.00



Find the polar representation of the number $z = -1 + i\sqrt{3}$.

1. $2(cos\frac{2\pi}{3} + isin\frac{2\pi}{3})$
2. $cos\frac{2\pi}{3} + isin\frac{2\pi}{3}$
3. $2(cos\frac{\pi}{4} + isin\frac{\pi}{4})$
4. $cos\frac{\pi}{4} + isin\frac{\pi}{4}$

A1 : 1

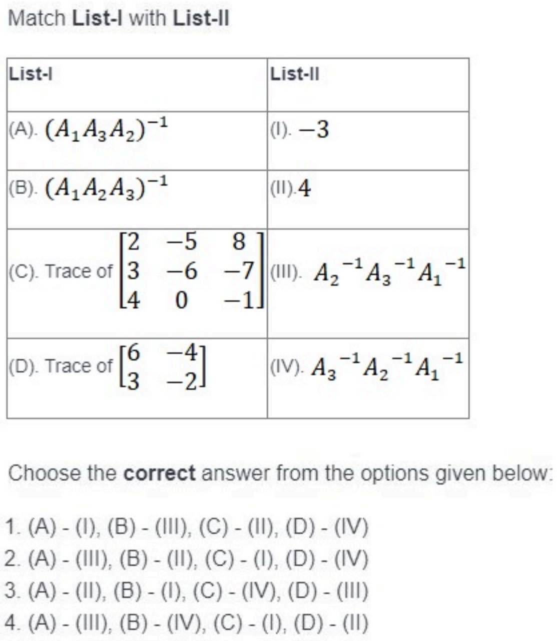
A2 : 2

A3 : 3

A4 : 4

Objective Question

10 14121010 1.0 0.00



Match **List-I** with **List-II**

List-I	**List-II**
(A). $(A_1A_3A_2)^{-1}$	(I). -3
(B). $(A_1A_2A_3)^{-1}$	(II). 4
(C). Trace of $\begin{bmatrix} 2 & -5 & 8 \\ 3 & -6 & -7 \\ 4 & 0 & -1 \end{bmatrix}$	(III). $A_2{}^{-1}A_3{}^{-1}A_1{}^{-1}$
(D). Trace of $\begin{bmatrix} 6 & -4 \\ 3 & -2 \end{bmatrix}$	(IV). $A_3{}^{-1}A_2{}^{-1}A_1{}^{-1}$

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
2. (A) - (III), (B) - (II), (C) - (I), (D) - (IV)
3. (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

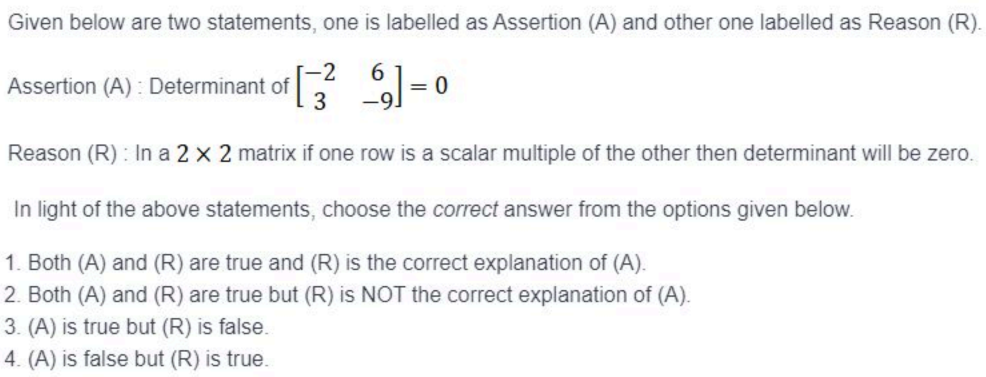
A2 : 2

A3 : 3

A4 : 4

Objective Question

11 14121011 1.0 0.00



Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : Determinant of $\begin{bmatrix} -2 & 6 \\ 3 & -9 \end{bmatrix} = 0$

Reason (R) : In a 2×2 matrix if one row is a scalar multiple of the other then determinant will be zero.

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
3. (A) is true but (R) is false.
4. (A) is false but (R) is true.

A1 : 1

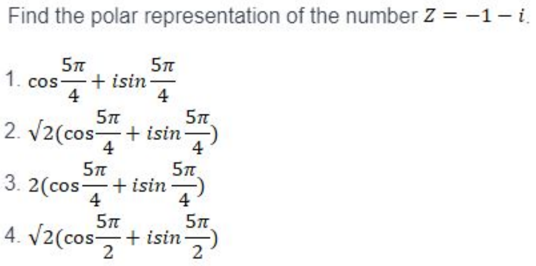
A2 : 2

A3 : 3

A4 : 4

Objective Question

12 14121012 1.0 0.00



Find the polar representation of the number $Z = -1 - i$.

1. $\cos\frac{5\pi}{4} + isin\frac{5\pi}{4}$
2. $\sqrt{2}(\cos\frac{5\pi}{4} + isin\frac{5\pi}{4})$
3. $2(\cos\frac{5\pi}{4} + isin\frac{5\pi}{4})$
4. $\sqrt{2}(\cos\frac{5\pi}{2} + isin\frac{5\pi}{2})$

A1 : 1

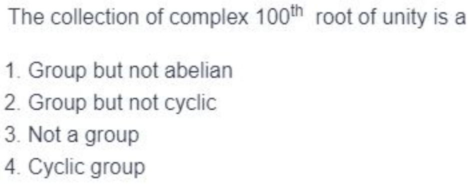
A2 : 2

A3 : 3

A4 : 4

Objective Question

13 14121013 1.0 0.00



The collection of complex 100th root of unity is a

1. Group but not abelian
2. Group but not cyclic
3. Not a group
4. Cyclic group

A1 : 1

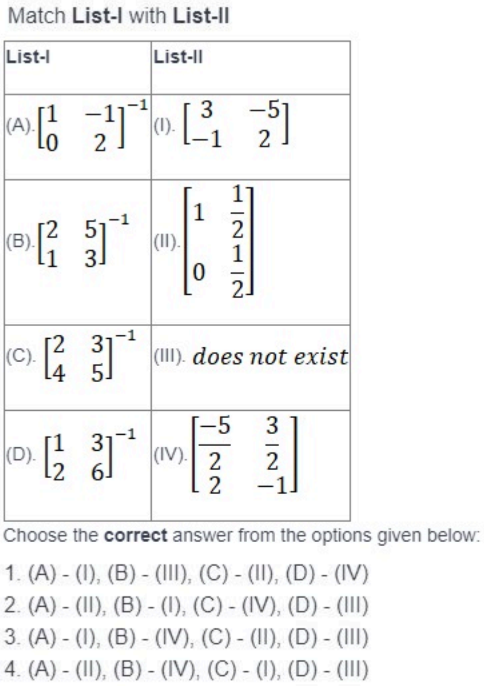
A2 : 2

A3 : 3

A4 : 4

Objective Question

14 14121014 1.0 0.00



Match **List-I** with **List-II**

List-I	**List-II**
(A). $\begin{bmatrix} 1 & -1 \\ 0 & 2 \end{bmatrix}^{-1}$	(I). $\begin{bmatrix} 3 & -5 \\ -1 & 2 \end{bmatrix}$
(B). $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}^{-1}$	(II). $\begin{bmatrix} 1 & \frac{1}{2} \\ 0 & \frac{1}{2} \end{bmatrix}$
(C). $\begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}^{-1}$	(III). $does\ not\ exist$
(D). $\begin{bmatrix} 1 & 3 \\ 2 & 6 \end{bmatrix}^{-1}$	(IV). $\begin{bmatrix} \frac{-5}{2} & \frac{3}{2} \\ 2 & -1 \end{bmatrix}$

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
2. (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
3. (A) - (I), (B) - (IV), (C) - (II), (D) - (III)
4. (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

A1 : 1

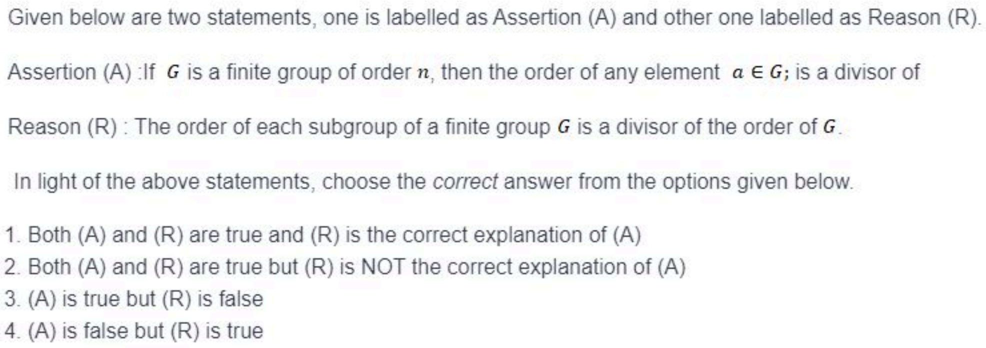
A2 : 2

A3 : 3

A4 : 4

Objective Question

15 14121015 1.0 0.00



Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) :If G is a finite group of order n, then the order of any element $a \in G;$ is a divisor of

Reason (R) : The order of each subgroup of a finite group G is a divisor of the order of G.

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A)
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A)
3. (A) is true but (R) is false
4. (A) is false but (R) is true

A1 : 1

A2 : 2

A3 : 3

		A4 : 4		
Objective Question				
16	14121016	Sum of the absolute values of all the n^{th} roots of unity is, 1. 1 2. 0 3. -1 4. n A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
17	14121017	Let m and n be positive integers, then the common roots of unity shared by the m^{th} and n^{th} roots of unity are precisely the k^{th} roots of unity where k is, 1. gcd (m,n) 2. mn 3. m 4. n A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
18	14121018	Find the value of $(cos\frac{\pi}{6} + isin\frac{\pi}{6})^{18}$ 1. 1 2. 0 3. 1/2 4. 18 A1 : 1 A2 : 2 A3 : 3	1.0	0.00

A4 : 4

Objective Question

19 14121019 1.0 0.00

If $x+\frac{1}{x}=2cos\theta$, then find the value of $x^{12}+\frac{1}{x^{12}}$

1. $2cos6\theta$
2. $cos6\theta$
3. $cos12\theta$
4. $2cos12\theta$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

20 14121020 1.0 0.00

Which of the following statements are correct?

(A). A non-empty subset $G^{'}$ of a group G is a subgroup of G if and only if for all $a,b\in G^{'}, a^{-1}\circ b\in G^{'}$.

(B).Let a be an element of a group $G.$ Then $G^{'}=\{a^n:n\in I\}$ of all integral powers of a is a subgroup of G .

(C). If S is any set of subgroups of a group G, the intersection of these subgroups is also a subgroup of G.

(D).Every subgroup of a cyclic group need not be a cyclic group.

Choose the ***correct*** answer from the options given below:

1. (A) and (D) only.
2. (B) and (D) only.
3. (A), (C) and (D).
4. (A), (B) and (C) only.

A1 : 1

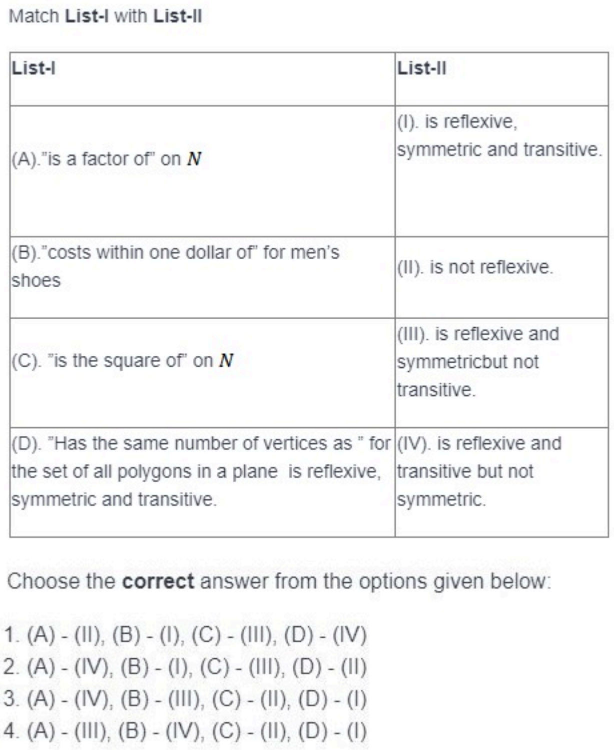
A2 : 2

A3 : 3

A4 : 4

Objective Question

21 14121021 1.0 0.00



Match **List-I** with **List-II**

List-I	**List-II**
(A)."is a factor of" on N	(I). is reflexive, symmetric and transitive.
(B)."costs within one dollar of" for men's shoes	(II). is not reflexive.
(C). "is the square of" on N	(III). is reflexive and symmetricbut not transitive.
(D). "Has the same number of vertices as " for the set of all polygons in a plane is reflexive, symmetric and transitive.	(IV). is reflexive and transitive but not symmetric.

Choose the **correct** answer from the options given below:

1. (A) - (II), (B) - (I), (C) - (III), (D) - (IV)
2. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)
3. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

A1 : 1

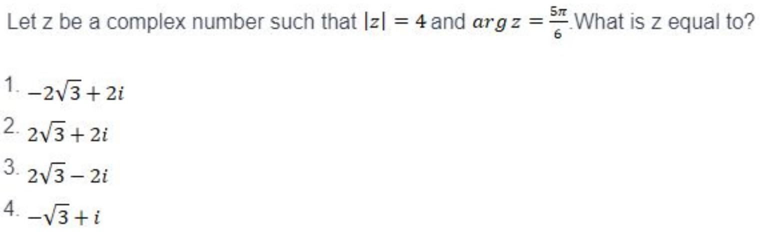
A2 : 2

A3 : 3

A4 : 4

Objective Question

22 14121022 1.0 0.00



Let z be a complex number such that $|z| = 4$ and $arg\, z = \frac{5\pi}{6}$. What is z equal to?

1. $-2\sqrt{3} + 2i$
2. $2\sqrt{3} + 2i$
3. $2\sqrt{3} - 2i$
4. $-\sqrt{3} + i$

A1 : 1

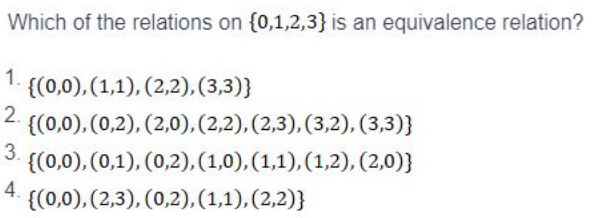
A2 : 2

A3 : 3

A4 : 4

Objective Question

23 14121023 1.0 0.00



Which of the relations on $\{0,1,2,3\}$ is an equivalence relation?

1. $\{(0,0),(1,1),(2,2),(3,3)\}$
2. $\{(0,0),(0,2),(2,0),(2,2),(2,3),(3,2),(3,3)\}$
3. $\{(0,0),(0,1),(0,2),(1,0),(1,1),(1,2),(2,0)\}$
4. $\{(0,0),(2,3),(0,2),(1,1),(2,2)\}$

A1 : 1

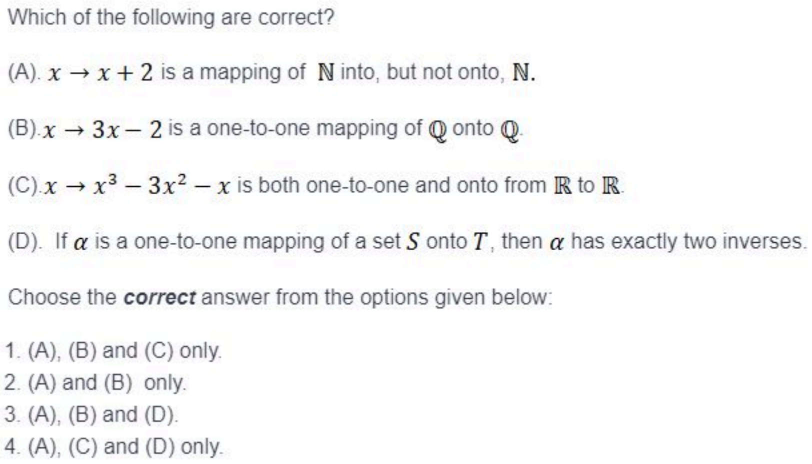
A2 : 2

A3 : 3

A4 : 4

Objective Question

24 14121024 1.0 0.00



Which of the following are correct?

(A). $x \to x+2$ is a mapping of $\mathbb{N}$ into, but not onto, $\mathbb{N}$.

(B). $x \to 3x-2$ is a one-to-one mapping of $\mathbb{Q}$ onto $\mathbb{Q}$.

(C). $x \to x^3-3x^2-x$ is both one-to-one and onto from $\mathbb{R}$ to $\mathbb{R}$.

(D). If α is a one-to-one mapping of a set S onto T, then α has exactly two inverses.

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (C) only.
2. (A) and (B) only.
3. (A), (B) and (D).
4. (A), (C) and (D) only.

A1 : 1

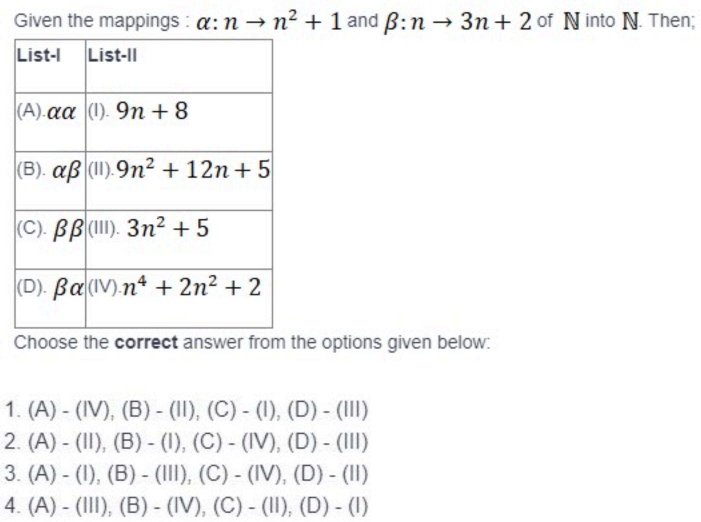
A2 : 2

A3 : 3

A4 : 4

Objective Question

25 14121025 1.0 0.00



Given the mappings : $\alpha: n \rightarrow n^2 + 1$ and $\beta: n \rightarrow 3n + 2$ of $\mathbb{N}$ into $\mathbb{N}$. Then;

List-I	List-II
(A). $\alpha\alpha$	(I). $9n + 8$
(B). $\alpha\beta$	(II). $9n^2 + 12n + 5$
(C). $\beta\beta$	(III). $3n^2 + 5$
(D). $\beta\alpha$	(IV). $n^4 + 2n^2 + 2$

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (II), (C) - (I), (D) - (III)
2. (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
3. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
4. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

A1 : 1

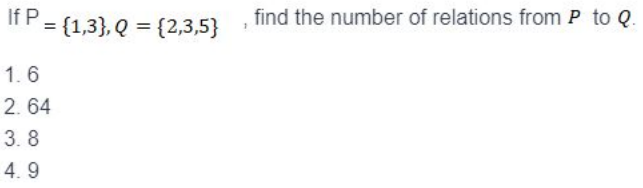
A2 : 2

A3 : 3

A4 : 4

Objective Question

26 14121026 1.0 0.00



If P $= \{1,3\}, Q = \{2,3,5\}$, find the number of relations from P to Q.

1. 6
2. 64
3. 8
4. 9

A1 : 1

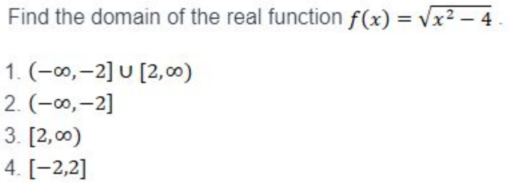
A2 : 2

A3 : 3

A4 : 4

Objective Question

27 14121027 1.0 0.00



Find the domain of the real function $f(x) = \sqrt{x^2 - 4}$.

1. $(-\infty, -2] \cup [2, \infty)$
2. $(-\infty, -2]$
3. $[2, \infty)$
4. $[-2, 2]$

A1 : 1

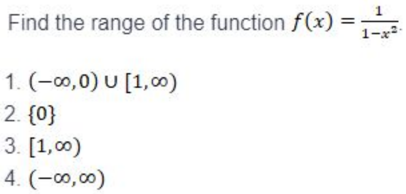
A2 : 2

A3 : 3

A4 : 4

Objective Question

28 14121028 1.0 0.00



Find the range of the function $f(x) = \frac{1}{1-x^2}$.

1. $(-\infty, 0) \cup [1, \infty)$
2. $\{0\}$
3. $[1, \infty)$
4. $(-\infty, \infty)$

A1 : 1

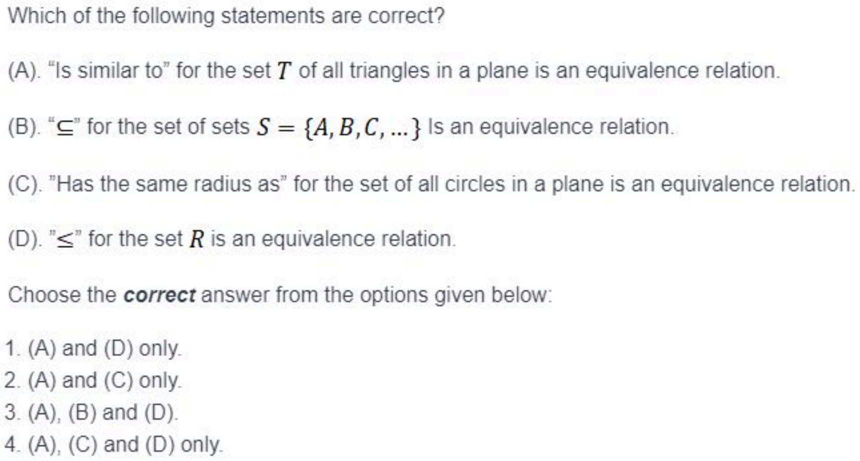
A2 : 2

A3 : 3

A4 : 4

Objective Question

29 14121029 1.0 0.00



Which of the following statements are correct?

(A). “Is similar to” for the set T of all triangles in a plane is an equivalence relation.

(B). “⊆” for the set of sets $S = \{A, B, C, \ldots\}$ Is an equivalence relation.

(C). ”Has the same radius as” for the set of all circles in a plane is an equivalence relation.

(D). ”≤” for the set R is an equivalence relation.

Choose the ***correct*** answer from the options given below:

1. (A) and (D) only.
2. (A) and (C) only.
3. (A), (B) and (D).
4. (A), (C) and (D) only.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

30 14121030 1.0 0.00

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) :Since $(\alpha\beta)(\beta^{-1} \circ \alpha^{-1}) = Identity\ function, (\beta^{-1} \circ \alpha^{-1})$ is the inverse of $\alpha\beta.$

Reason (R) : If α is a one-to-one mapping of a set S onto T, then α has a unique inverse and conversely .

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A)
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A)
3. (A) is true but (R) is false
4. (A) is false but (R) is true

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

31 14121031 1.0 0.00

The solution to $f(x) = f^{-1}(x)$ are

1. no solutions in any case
2. same as solution to $f(x) = x$
3. infinite number of solution for every case
4. unique solution for every case

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

32 14121032 1.0 0.00

If cardinality of $(A \cup B)$ = cardinality of A + cardinality of $B.$ This means that

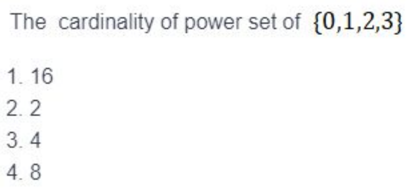
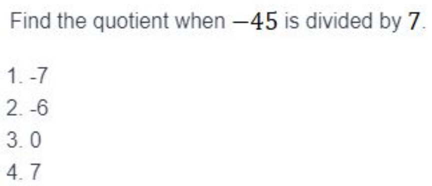
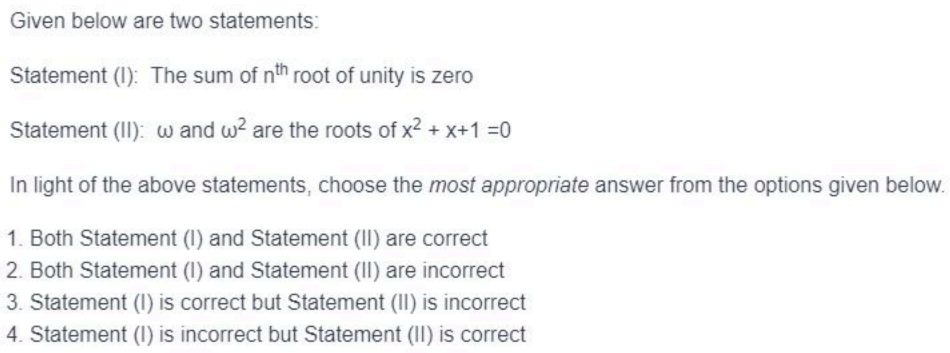
1. A is a subset of B.
2. B is a subset of $A.$
3. A and B are disjoint.
4. A and B are of same cardinality.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question				
33	14121033	 The cardinality of power set of $\{0,1,2,3\}$ 1. 16 2. 2 3. 4 4. 8 A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
34	14121034	 Find the quotient when -45 is divided by 7. 1. -7 2. -6 3. 0 4. 7 A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
35	14121035	 Given below are two statements: Statement (I): The sum of n^{th} root of unity is zero Statement (II): ω and ω^2 are the roots of $x^2 + x+1 =0$ In light of the above statements, choose the *most appropriate* answer from the options given below. 1. Both Statement (I) and Statement (II) are correct 2. Both Statement (I) and Statement (II) are incorrect 3. Statement (I) is correct but Statement (II) is incorrect 4. Statement (I) is incorrect but Statement (II) is correct A1 : 1 A2 : 2 A3 : 3	1.0	0.00

A4 : 4

Objective Question

36 14121036 1.0 0.00

The other name of base-10 representation is

1. Octal representation
2. Hexadecimal representation
3. Decimal representation
4. Deca representation

A1 : 1

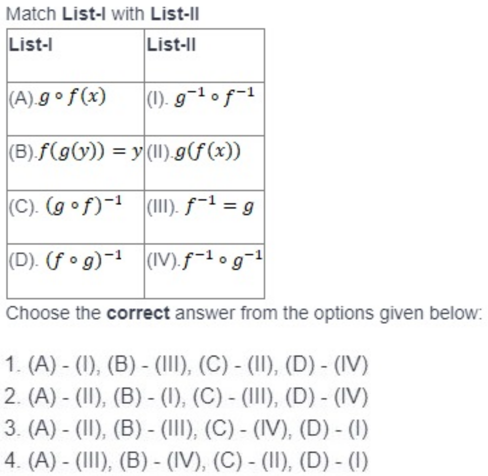
A2 : 2

A3 : 3

A4 : 4

Objective Question

37 14121037 1.0 0.00



Match **List-I** with **List-II**

List-I	List-II
(A). $g \circ f(x)$	(I). $g^{-1} \circ f^{-1}$
(B). $f(g(y)) = y$	(II). $g(f(x))$
(C). $(g \circ f)^{-1}$	(III). $f^{-1} = g$
(D). $(f \circ g)^{-1}$	(IV). $f^{-1} \circ g^{-1}$

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
2. (A) - (II), (B) - (I), (C) - (III), (D) - (IV)
3. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

A1 : 1

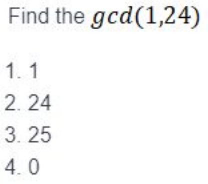
A2 : 2

A3 : 3

A4 : 4

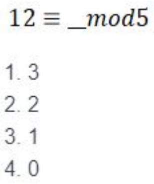
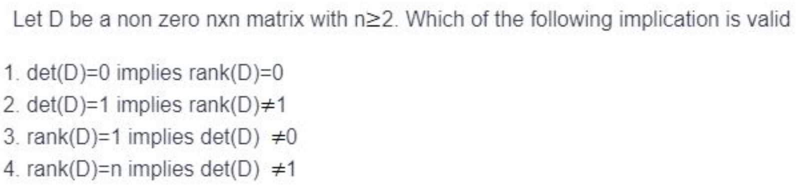
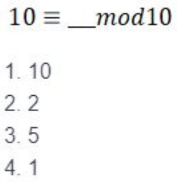
Objective Question

38 14121038 1.0 0.00



Find the $gcd(1,24)$

1. 1
2. 24
3. 25
4. 0

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
39	14121039	 $12 \equiv \_mod5$ 1. 3 2. 2 3. 1 4. 0 A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
40	14121040	 Let D be a non zero nxn matrix with n≥2. Which of the following implication is valid 1. det(D)=0 implies rank(D)=0 2. det(D)=1 implies rank(D)≠1 3. rank(D)=1 implies det(D) ≠0 4. rank(D)=n implies det(D) ≠1 A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
41	14121041	 $10 \equiv \_\_mod10$ 1. 10 2. 2 3. 5 4. 1 A1 : 1	1.0	0.00

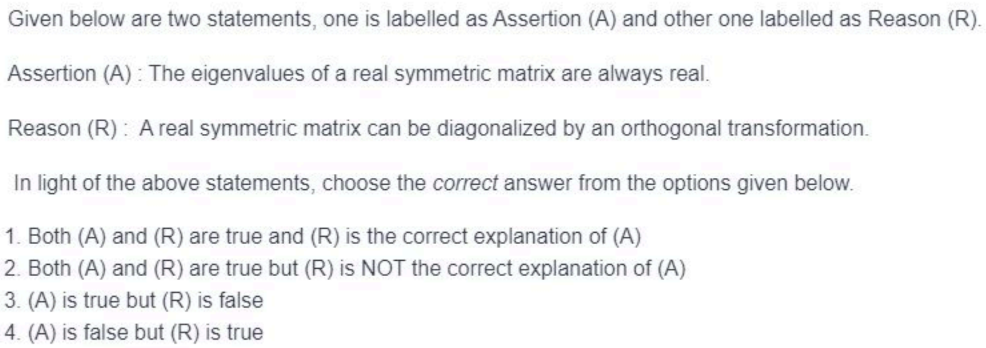
A2 : 2

A3 : 3

A4 : 4

Objective Question

42 14121042 1.0 0.00



Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : The eigenvalues of a real symmetric matrix are always real.

Reason (R) : A real symmetric matrix can be diagonalized by an orthogonal transformation.

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A)
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A)
3. (A) is true but (R) is false
4. (A) is false but (R) is true

A1 : 1

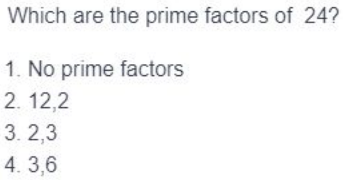
A2 : 2

A3 : 3

A4 : 4

Objective Question

43 14121043 1.0 0.00



Which are the prime factors of 24?

1. No prime factors
2. 12,2
3. 2,3
4. 3,6

A1 : 1

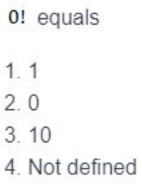
A2 : 2

A3 : 3

A4 : 4

Objective Question

44 14121044 1.0 0.00



0! equals

1. 1
2. 0
3. 10
4. Not defined

A1 : 1

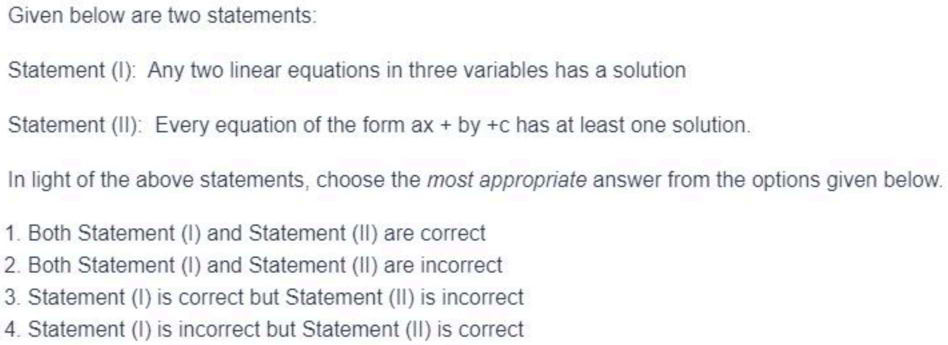
A2 : 2

A3 : 3

A4 : 4

Objective Question

45 14121045 1.0 0.00



Given below are two statements:

Statement (I): Any two linear equations in three variables has a solution

Statement (II): Every equation of the form ax + by +c has at least one solution.

In light of the above statements, choose the *most appropriate* answer from the options given below.

1. Both Statement (I) and Statement (II) are correct
2. Both Statement (I) and Statement (II) are incorrect
3. Statement (I) is correct but Statement (II) is incorrect
4. Statement (I) is incorrect but Statement (II) is correct

A1 : 1

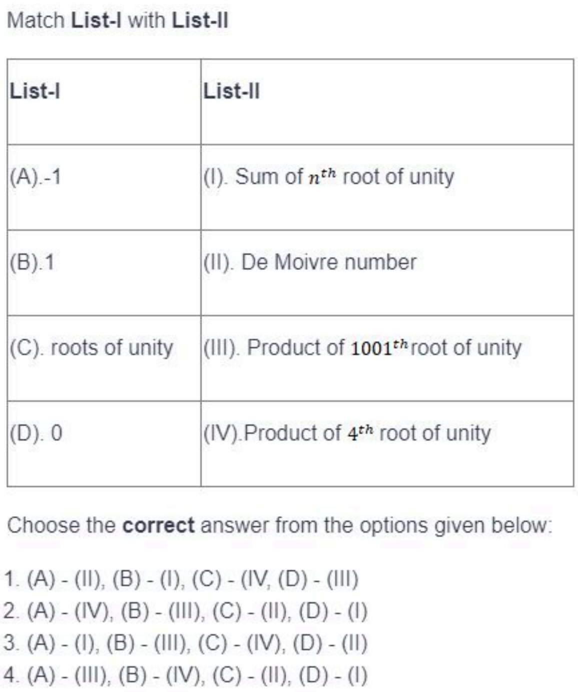
A2 : 2

A3 : 3

A4 : 4

Objective Question

46 14121046 1.0 0.00



Match **List-I** with **List-II**

List-I	**List-II**
(A).-1	(I). Sum of n^{th} root of unity
(B).1	(II). De Moivre number
(C). roots of unity	(III). Product of 1001^{th}root of unity
(D). 0	(IV).Product of 4^{th} root of unity

Choose the **correct** answer from the options given below:

1. (A) - (II), (B) - (I), (C) - (IV, (D) - (III)
2. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)
3. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
4. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

A1 : 1

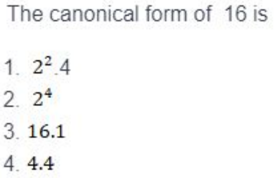
A2 : 2

A3 : 3

A4 : 4

Objective Question

47 14121047 1.0 0.00



The canonical form of 16 is

1. $2^2.4$
2. 2^4
3. 16.1
4. 4.4

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

48 14121048 1.0 0.00

The set which consists of more than one equation is classified as

1. System of Equations
2. System of variables
3. System of constants
4. System of coefficients

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

49 14121049 1.0 0.00

Let A be a 3x3 real matrix whose characteristic polynomial p(T) is divisible by T^2 . Which of the following statements is true?

1. The eigenspace of A for the eigenvalue 0is two-dimensional
2. All the eigenvalues of A are real
3. $A^3 = 0$
4. A is diagonalizable

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

50 14121050 1.0 0.00

The method of eliminating one variable by adding or subtracting two equations with common term is called the ________ method.

1. Elimination
2. Substitution
3. Reduction
4. Division

A1 : 1

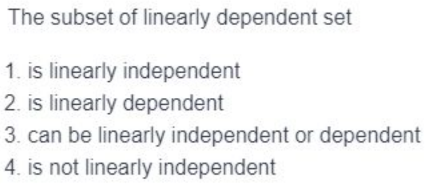
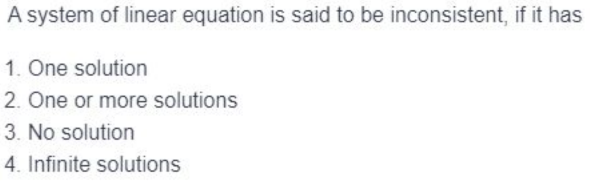
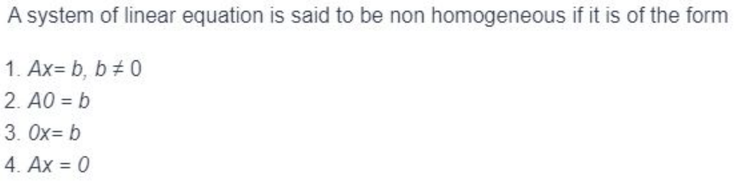
A2 : 2

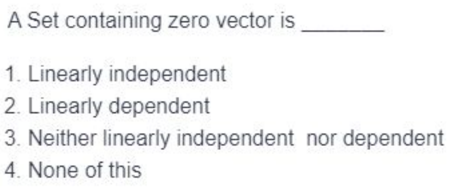
A3 : 3

A4 : 4

Objective Question

51 14121051 1.0 0.00

		 The subset of linearly dependent set 1. is linearly independent 2. is linearly dependent 3. can be linearly independent or dependent 4. is not linearly independent A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
52	14121052	 A system of linear equation is said to be inconsistent, if it has 1. One solution 2. One or more solutions 3. No solution 4. Infinite solutions A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
53	14121053	 A system of linear equation is said to be non homogeneous if it is of the form 1. $Ax= b, b \neq 0$ 2. $A0 = b$ 3. $0x= b$ 4. $Ax = 0$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
54	14121054		1.0	0.00



A Set containing zero vector is _______

1. Linearly independent
2. Linearly dependent
3. Neither linearly independent nor dependent
4. None of this

A1 : 1

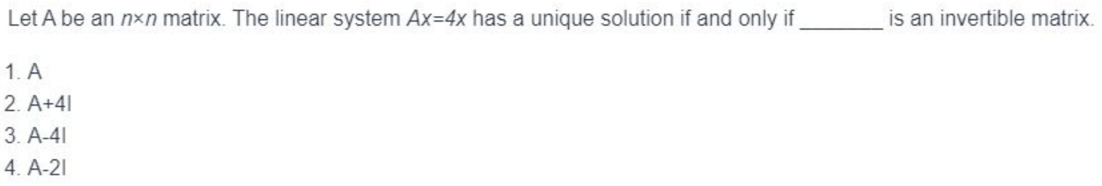
A2 : 2

A3 : 3

A4 : 4

Objective Question

55 14121055 1.0 0.00



Let A be an $n \times n$ matrix. The linear system $Ax=4x$ has a unique solution if and only if _______ is an invertible matrix.

1. A
2. A+4I
3. A-4I
4. A-2I

A1 : 1

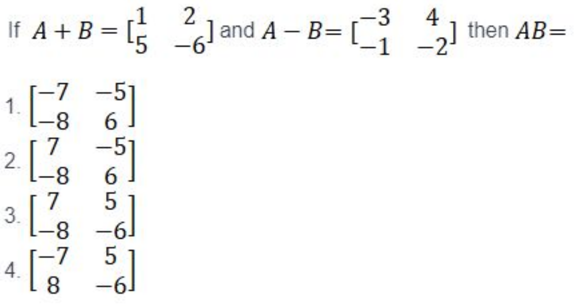
A2 : 2

A3 : 3

A4 : 4

Objective Question

56 14121056 1.0 0.00



If $A+B=\begin{bmatrix}1 & 2\\5 & -6\end{bmatrix}$ and $A-B=\begin{bmatrix}-3 & 4\\-1 & -2\end{bmatrix}$ then $AB=$

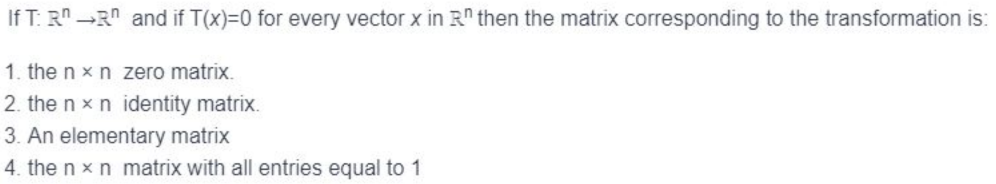
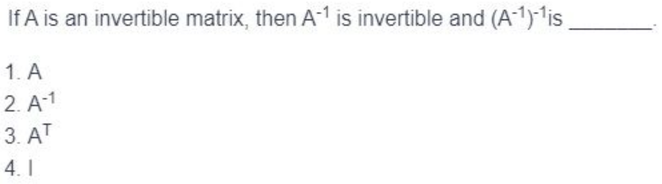
1. $\begin{bmatrix}-7 & -5\\-8 & 6\end{bmatrix}$
2. $\begin{bmatrix}7 & -5\\-8 & 6\end{bmatrix}$
3. $\begin{bmatrix}7 & 5\\-8 & -6\end{bmatrix}$
4. $\begin{bmatrix}-7 & 5\\8 & -6\end{bmatrix}$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question				
57	14121057	 If T: $\mathbb{R}^n \rightarrow \mathbb{R}^n$ and if T(x)=0 for every vector x in $\mathbb{R}^n$ then the matrix corresponding to the transformation is: 1. the n × n zero matrix. 2. the n × n identity matrix. 3. An elementary matrix 4. the n × n matrix with all entries equal to 1 A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
58	14121058	 If A is an invertible matrix, then A^{-1} is invertible and $(A^{-1})^{-1}$is _______. 1. A 2. A^{-1} 3. A^T 4. I A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
59	14121059		1.0	0.00

Match **List-I** with **List-II**

List-I	**List-II**
(A). $f(x)=x^2$	(I). Not a function
(B). $g(x)=e^x$	(II). Bijective
(C). $h(x)=x$	(III). Surjective
(D). $d(x)=\sqrt{x}$	(IV). Injective

Choose the **correct** answer from the options given below:

1. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)
2. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
4. (A) - (II), (B) - (III), (C) - (I), (D) - (IV)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

60 14121060 1.0 0.00

If A and B are n × n invertible matrices then $(AB)^{-1}$ is given by

1. $A^{-1}B^{-1}$
2. AB
3. BA
4. $B^{-1}A^{-1}$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

61 14121061 1.0 0.00

If A is an $m \times n$ matrix,

Then $\dim(row(A)) + \dim(col(A)) + \dim(null(A)) + \dim\ (null(A^T)$ is

1. n
2. 2n+2m
3. m
4. n+m

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

62 14121062 1.0 0.00

The eigen values of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 0 & -4 & 2 \\ 0 & 0 & 7 \end{bmatrix}$ are

1. 1,-4,7
2. 1,4,7
3. 0,4,7
4. 1,-4,-7

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

63 14121063 1.0 0.00

If matrix $A = \begin{bmatrix} 4 & 3 \\ 9 & -2 \end{bmatrix}$ has eigen values -5 and 7. The eigenvector is ________

1. $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$
2. $\begin{bmatrix} 3 \\ 4 \end{bmatrix}$
3. $\begin{bmatrix} 2 \\ -6 \end{bmatrix}$
4. $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$

A1 : 1

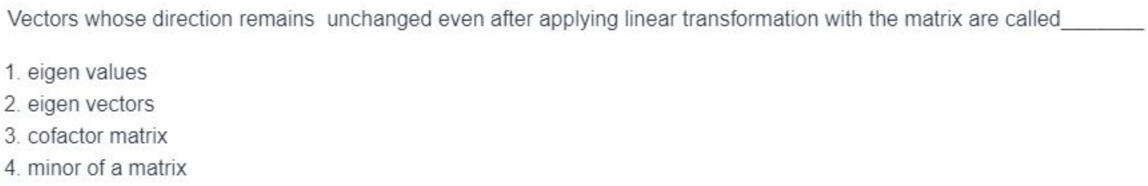
A2 : 2

A3 : 3

A4 : 4

Objective Question

64 14121064 1.0 0.00



Vectors whose direction remains unchanged even after applying linear transformation with the matrix are called_______

1. eigen values
2. eigen vectors
3. cofactor matrix
4. minor of a matrix

A1 : 1

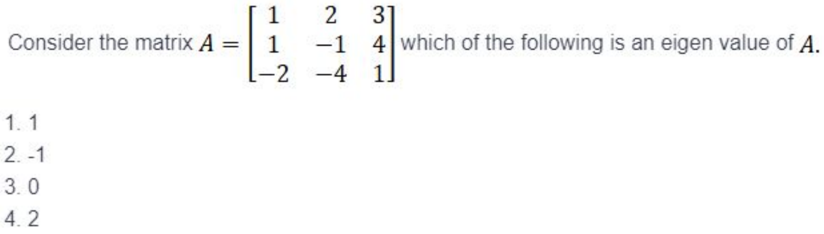
A2 : 2

A3 : 3

A4 : 4

Objective Question

65 14121065 1.0 0.00



Consider the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & -1 & 4 \\ -2 & -4 & 1 \end{bmatrix}$ which of the following is an eigen value of $A.$

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

A1 : 1

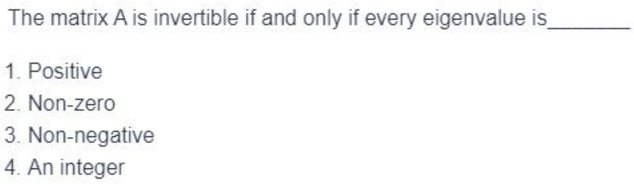
A2 : 2

A3 : 3

A4 : 4

Objective Question

66 14121066 1.0 0.00



The matrix A is invertible if and only if every eigenvalue is_______

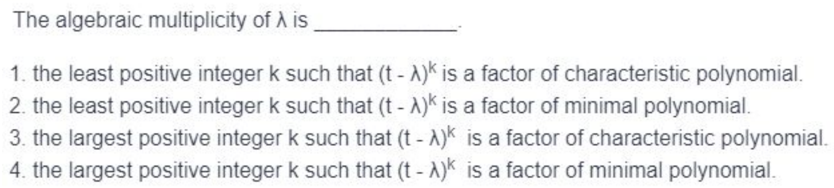
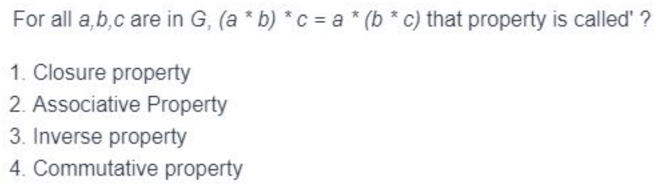
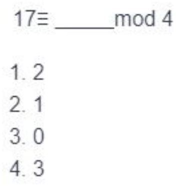
1. Positive
2. Non-zero
3. Non-negative
4. An integer

A1 : 1

A2 : 2

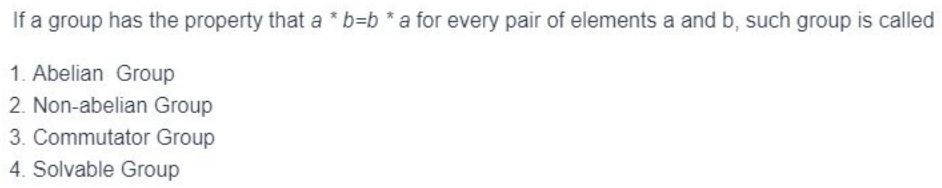
A3 : 3

A4 : 4

Objective Question				
67	14121067	 The algebraic multiplicity of λ is _____________. 1. the least positive integer k such that $(t - \lambda)^k$ is a factor of characteristic polynomial. 2. the least positive integer k such that $(t - \lambda)^k$ is a factor of minimal polynomial. 3. the largest positive integer k such that $(t - \lambda)^k$ is a factor of characteristic polynomial. 4. the largest positive integer k such that $(t - \lambda)^k$ is a factor of minimal polynomial. A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
68	14121068	 For all *a,b,c* are in *G*, *(a * b) * c = a * (b * c)* that property is called' ? 1. Closure property 2. Associative Property 3. Inverse property 4. Commutative property A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
69	14121069	 17≡ _____mod 4 1. 2 2. 1 3. 0 4. 3 A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00

Objective Question

70 14121070 1.0 0.00



If a group has the property that $a * b = b * a$ for every pair of elements a and b, such group is called

1. Abelian Group
2. Non-abelian Group
3. Commutator Group
4. Solvable Group

A1 : 1

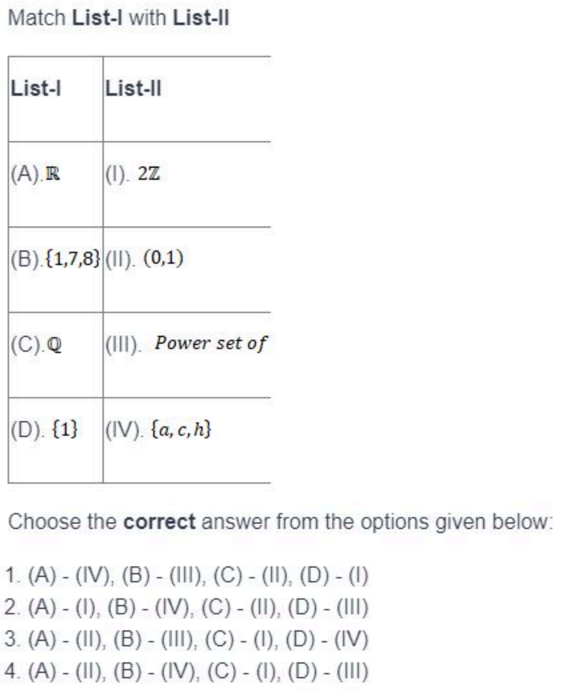
A2 : 2

A3 : 3

A4 : 4

Objective Question

71 14121071 1.0 0.00



Match **List-I** with **List-II**

List-I	**List-II**
(A). $\mathbb{R}$	(I). $2\mathbb{Z}$
(B). $\{1,7,8\}$	(II). $(0,1)$
(C). $\mathbb{Q}$	(III). *Power set of*
(D). $\{1\}$	(IV). $\{a, c, h\}$

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)
2. (A) - (I), (B) - (IV), (C) - (II), (D) - (III)
3. (A) - (II), (B) - (III), (C) - (I), (D) - (IV)
4. (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

A1 : 1

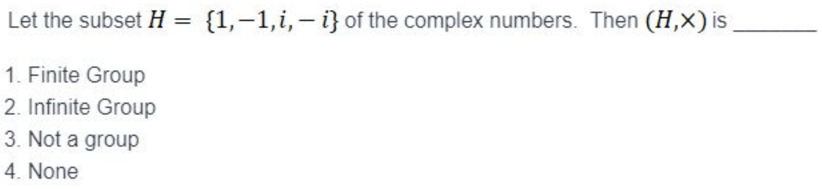
A2 : 2

A3 : 3

A4 : 4

Objective Question

72 14121072 1.0 0.00



Let the subset $H = \{1,-1,i,-i\}$ of the complex numbers. Then $(H,\times)$ is _______

1. Finite Group
2. Infinite Group
3. Not a group
4. None

A1 : 1

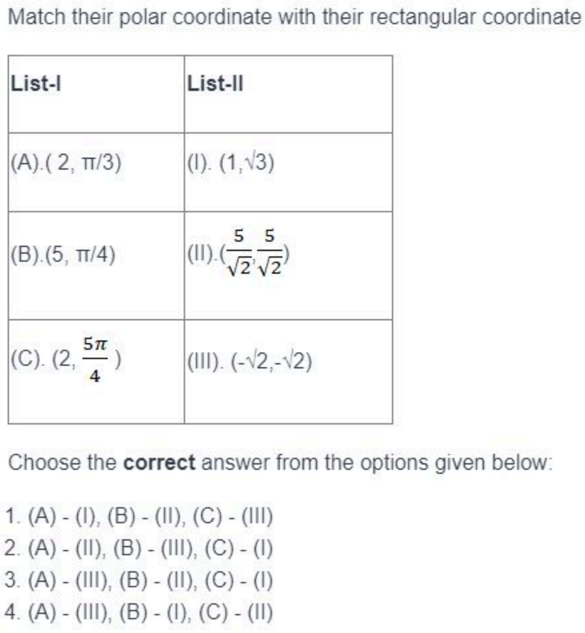
A2 : 2

A3 : 3

A4 : 4

Objective Question

73 14121073 1.0 0.00



Match their polar coordinate with their rectangular coordinate

List-I	**List-II**
(A).(2, π/3)	(I). (1,√3)
(B).(5, π/4)	(II).($\frac{5}{\sqrt{2}}$,$\frac{5}{\sqrt{2}}$)
(C). (2, $\frac{5\pi}{4}$)	(III). (-√2,-√2)

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III)
2. (A) - (II), (B) - (III), (C) - (I)
3. (A) - (III), (B) - (II), (C) - (I)
4. (A) - (III), (B) - (I), (C) - (II)

A1 : 1

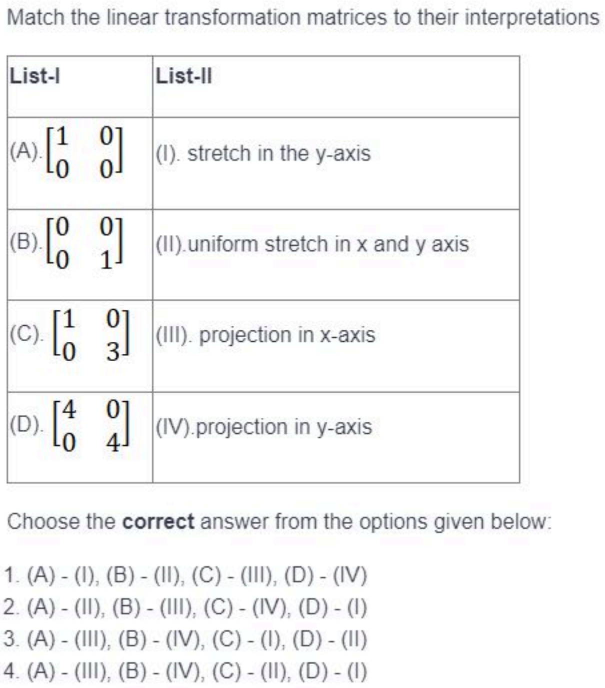
A2 : 2

A3 : 3

A4 : 4

Objective Question

74 14121074 1.0 0.00



Match the linear transformation matrices to their interpretations

List-I	List-II
(A). $\begin{bmatrix}1 & 0\\0 & 0\end{bmatrix}$	(I). stretch in the y-axis
(B). $\begin{bmatrix}0 & 0\\0 & 1\end{bmatrix}$	(II).uniform stretch in x and y axis
(C). $\begin{bmatrix}1 & 0\\0 & 3\end{bmatrix}$	(III). projection in x-axis
(D). $\begin{bmatrix}4 & 0\\0 & 4\end{bmatrix}$	(IV).projection in y-axis

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
3. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
4. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

A1 : 1

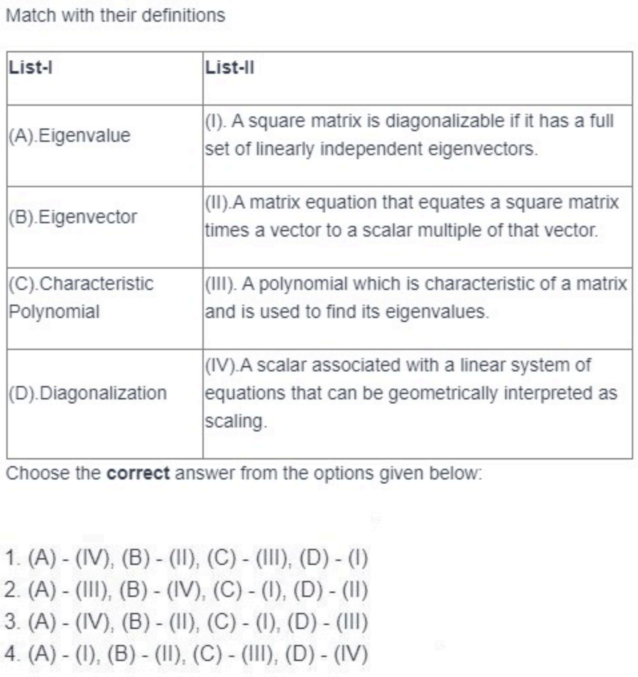
A2 : 2

A3 : 3

A4 : 4

Objective Question

75 14121075 1.0 0.00



Match with their definitions

List-I	List-II
(A).Eigenvalue	(I). A square matrix is diagonalizable if it has a full set of linearly independent eigenvectors.
(B).Eigenvector	(II).A matrix equation that equates a square matrix times a vector to a scalar multiple of that vector.
(C).Characteristic Polynomial	(III). A polynomial which is characteristic of a matrix and is used to find its eigenvalues.
(D).Diagonalization	(IV).A scalar associated with a linear system of equations that can be geometrically interpreted as scaling.

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (II), (C) - (III), (D) - (I)
2. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
3. (A) - (IV), (B) - (II), (C) - (I), (D) - (III)
4. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

A1 : 1

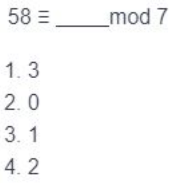
A2 : 2

A3 : 3

A4 : 4

Objective Question

76 14121076 1.0 0.00



58 ≡ _____mod 7

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

A1 : 1

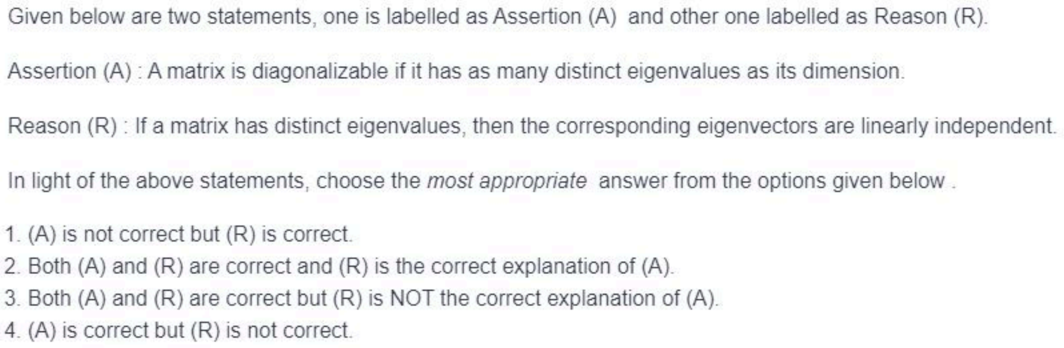
A2 : 2

A3 : 3

A4 : 4

Objective Question

77 14121077 1.0 0.00



Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : A matrix is diagonalizable if it has as many distinct eigenvalues as its dimension.

Reason (R) : If a matrix has distinct eigenvalues, then the corresponding eigenvectors are linearly independent.

In light of the above statements, choose the *most appropriate* answer from the options given below .

1. (A) is not correct but (R) is correct.
2. Both (A) and (R) are correct and (R) is the correct explanation of (A).
3. Both (A) and (R) are correct but (R) is NOT the correct explanation of (A).
4. (A) is correct but (R) is not correct.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

78 14121078 1.0 0.00

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : Every real symmetric matrix is diagonalizable.

Reason (R) : The spectral theorem states that every real symmetric matrix can be orthogonally diagonalized.

In light of the above statements, choose the *most appropriate* answer from the options given below .

1. (A) is not correct but (R) is correct.
2. Both (A) and (R) are correct and (R) is the correct explanation of (A).
3. Both (A) and (R) are correct but (R) is NOT the correct explanation of (A).
4. (A) is correct but (R) is not correct.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

79 14121079 1.0 0.00

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : If λ is an eigenvalue of a matrix A , then λ^2 is an eigenvalue of A^2

Reason (R) : The eigenvalues of A^2 are the squares of the eigenvalues of A .

In light of the above statements, choose the *most appropriate* answer from the options given below .

1. (A) is not correct but (R) is correct.
2. Both (A) and (R) are correct and (R) is the correct explanation of (A).
3. Both (A) and (R) are correct but (R) is NOT the correct explanation of (A).
4. (A) is correct but (R) is not correct.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

80 14121080 1.0 0.00

Which of the following statements is true about diagonalizable matrices?

1. All matrices are diagonalizable.
2. A matrix is diagonalizable if it has n distinct eigenvalues.
3. A matrix is diagonalizable if and only if it is invertible.
4. A matrix is diagonalizable if and only if it is a zero matrix.

A1 : 1

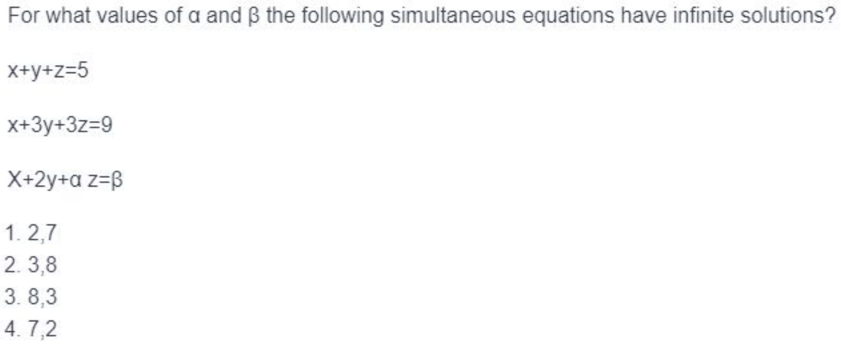
A2 : 2

A3 : 3

A4 : 4

Objective Question

81 14121081 1.0 0.00



For what values of α and β the following simultaneous equations have infinite solutions?

x+y+z=5

x+3y+3z=9

X+2y+α z=β

1. 2,7
2. 3,8
3. 8,3
4. 7,2

A1 : 1

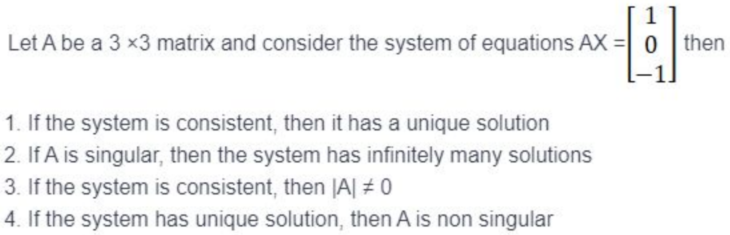
A2 : 2

A3 : 3

A4 : 4

Objective Question

82 14121082 1.0 0.00



Let A be a 3 ×3 matrix and consider the system of equations AX = $\begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$ then

1. If the system is consistent, then it has a unique solution
2. If A is singular, then the system has infinitely many solutions
3. If the system is consistent, then |A| ≠ 0
4. If the system has unique solution, then A is non singular

A1 : 1

A2 : 2

A3 : 3

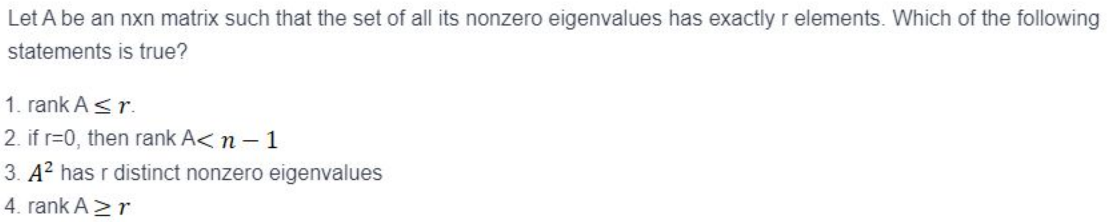
A4 : 4

Objective Question

83 14121083 1.0 0.00

		Let A be n×n matrix satisfying A^2 -7A +12 I=0, then which of the following is true? 1. A is invertible 2. t^2 -7t +12=0 where t=Tr(A) 3. d^2-7d+12=0 where d=det(A) 4. λ^2 -7λ +12=0 where λ is eigen value of A A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
84	14121084	Let T: $R^3 \to R^3$ be the linear transformation whose matrix wrt to standard basis $\{e_1,e_2,e_3\}$ of R^3. Then T 1. maps the subspace spanned by e_1 and e_2 into itself. 2. Has distinct eigenvalues 3. Has eigen vectors that span R^3 4. Has a non zero null space A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
85	14121085	Let V be a vector space of dimension 3 over Rℝ. Let $T: V \to V$ be a linear transformation given by the matrix A= $\begin{bmatrix} 1 & -1 & 0 \\ 1 & -4 & 3 \\ -2 & 5 & -3 \end{bmatrix}$ with ordered basis $\{V1, V2, V3\}$ of V. Then which of the following is true? 1. $T(V_2) = 0$ 2. $T(V_1 + V_2) = 0$ 3. $T(V_1 + V_2 + V_3) = 0$ 4. $T(V_1 + V_3) = T(V_2)$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				

86 14121086 1.0 0.00



Let A be an nxn matrix such that the set of all its nonzero eigenvalues has exactly r elements. Which of the following statements is true?

1. rank A$\leq r$.
2. if r=0, then rank A$< n-1$
3. A^2 has r distinct nonzero eigenvalues
4. rank A$\geq r$

A1 : 1

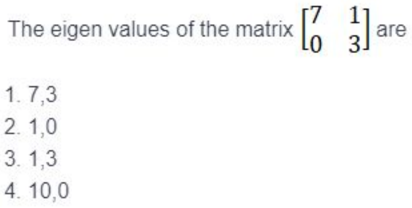
A2 : 2

A3 : 3

A4 : 4

Objective Question

87 14121087 1.0 0.00



The eigen values of the matrix $\begin{bmatrix}7 & 1\\0 & 3\end{bmatrix}$ are

1. 7,3
2. 1,0
3. 1,3
4. 10,0

A1 : 1

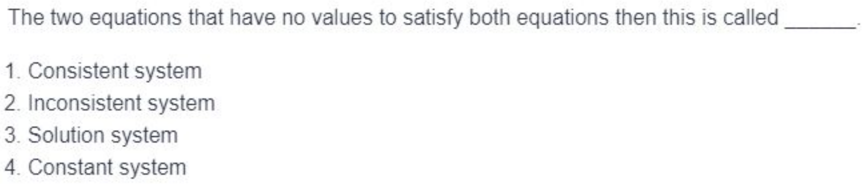
A2 : 2

A3 : 3

A4 : 4

Objective Question

88 14121088 1.0 0.00



The two equations that have no values to satisfy both equations then this is called ______.

1. Consistent system
2. Inconsistent system
3. Solution system
4. Constant system

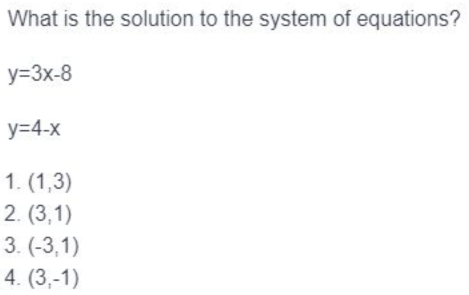
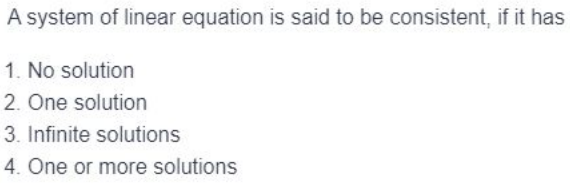
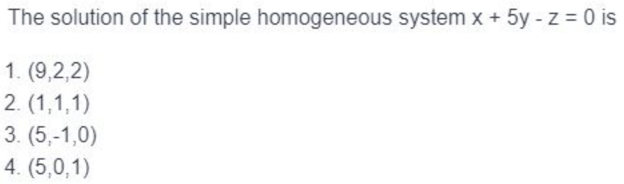
A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

89	14121089	 What is the solution to the system of equations? y=3x-8 y=4-x 1. (1,3) 2. (3,1) 3. (-3,1) 4. (3,-1) A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
90	14121090	 A system of linear equation is said to be consistent, if it has 1. No solution 2. One solution 3. Infinite solutions 4. One or more solutions A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
91	14121091	 The solution of the simple homogeneous system x + 5y - z = 0 is 1. (9,2,2) 2. (1,1,1) 3. (5,-1,0) 4. (5,0,1) A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00

Objective Question

92 14121092 1.0 0.00

Which of the following set of vectors in R^n is linearly independent

1. {(1,2),(1,3)}
2. {(2,4),(4,8)}
3. {(1,0),(0,1),(5,2)}
4. {(1,0),(5,0)}

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

93 14121093 1.0 0.00

Write matrix corresponding to the following linear transformations

$$y_1 = 2x_1 - x_2 - x_3$$

$$y_2 = 3x_1$$

$$y_3 = x_1 + x_2$$

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

A1 : 1

A2 : 2

A3 : 3

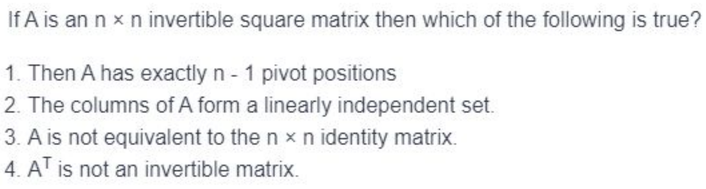
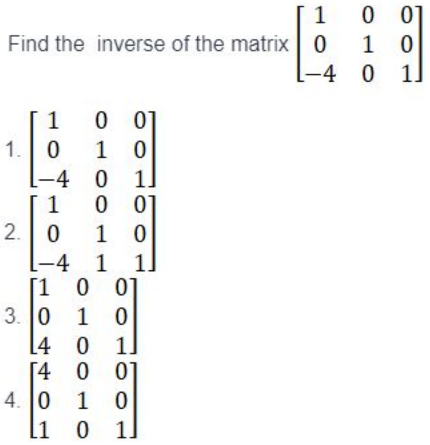
A4 : 4

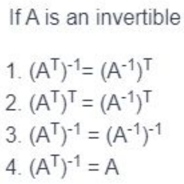
Objective Question

94 14121094 1.0 0.00

If A is an m ×n matrix, then the codomain of the transformation corresponding to A is:

1. R^n
2. R^{m+n}
3. R^{mn}
4. R^m

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
95	14121095	 If A is an n × n invertible square matrix then which of the following is true? 1. Then A has exactly n - 1 pivot positions 2. The columns of A form a linearly independent set. 3. A is not equivalent to the n × n identity matrix. 4. A^T is not an invertible matrix. A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
96	14121096	 Find the inverse of the matrix $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -4 & 0 & 1 \end{bmatrix}$ 1. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -4 & 0 & 1 \end{bmatrix}$ 2. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -4 & 1 & 1 \end{bmatrix}$ 3. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 4 & 0 & 1 \end{bmatrix}$ 4. $\begin{bmatrix} 4 & 0 & 0 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	1.0	0.00
Objective Question				
97	14121097		1.0	0.00



If A is an invertible square matrix then;

1. $(A^T)^{-1} = (A^{-1})^T$
2. $(A^T)^T = (A^{-1})^T$
3. $(A^T)^{-1} = (A^{-1})^{-1}$
4. $(A^T)^{-1} = A$

A1 : 1

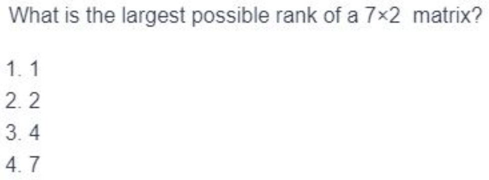
A2 : 2

A3 : 3

A4 : 4

Objective Question

98 14121098 1.0 0.00



What is the largest possible rank of a 7×2 matrix?

1. 1
2. 2
3. 4
4. 7

A1 : 1

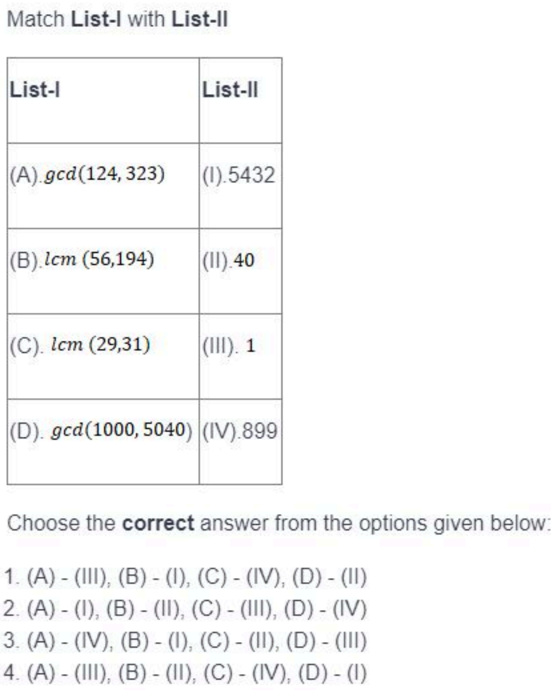
A2 : 2

A3 : 3

A4 : 4

Objective Question

99 14121099 1.0 0.00



Match **List-I** with **List-II**

List-I	**List-II**
(A). $gcd(124, 323)$	(I).5432
(B). $lcm\ (56,194)$	(II).40
(C). $lcm\ (29,31)$	(III). 1
(D). $gcd(1000, 5040)$	(IV).899

Choose the **correct** answer from the options given below:

1. (A) - (III), (B) - (I), (C) - (IV), (D) - (II)
2. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
3. (A) - (IV), (B) - (I), (C) - (II), (D) - (III)
4. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

A1 : 1

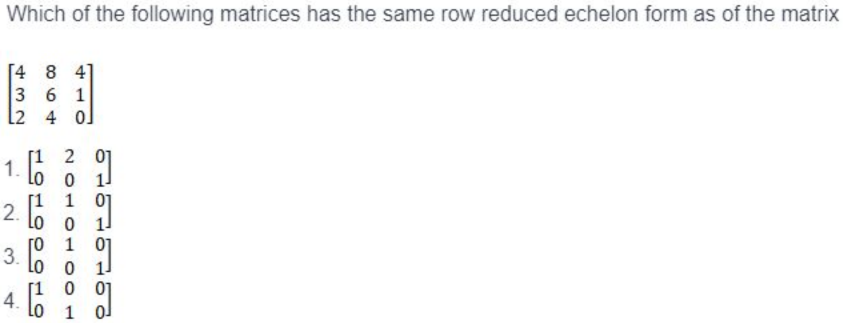
A2 : 2

A3 : 3

A4 : 4

Objective Question

100 14121100 1.0 0.00



Which of the following matrices has the same row reduced echelon form as of the matrix

$$\begin{bmatrix} 4 & 8 & 4 \\ 3 & 6 & 1 \\ 2 & 4 & 0 \end{bmatrix}$$

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

A1 : 1

A2 : 2

A3 : 3

A4 : 4