

Summary in Graph

Exam Summary (GO Classes CS Test Series 2025 | Engineering Mathematics | Subject Wise 1).

Qs. Attempted:	0 0 + 0	Correct Marks:	0 0 + 0
Correct Attempts:	0 0 + 0	Penalty Marks:	0 0 + 0
Incorrect Attempts:	0 0 + 0	Resultant Marks:	0 0 + 0

Total Questions:	30 10 + 20
Total Marks:	50 10 + 40
Exam Duration:	90 Minutes
Time Taken:	0 Minutes

- EXAM RESPONSE
- EXAM STATS
- FEEDBACK

Technical

Q #1Multiple Select TypeAward: 1Penalty: 0Mathematical Logic

Which of the following statements are true? Note that more than one statement may be true. You should indicate all the true statements.

- A. Eigen values can never be zero.
- B. Eigen vectors can never be the zero vector.
- C. If \vec{x} is an eigen vector of a matrix A , then $2\vec{x}$ is also an eigen vector of A .
- D. The maximum possible rank of 5×7 matrix is 5.

Your Answer:Correct Answer: B;C;DNot AttemptedTime taken: 00min 00secDiscuss

Q #2Numerical TypeAward: 1Penalty: 0Engineering Mathematics

If $\det \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} = 3$, what is $\det \begin{bmatrix} a_{31} & a_{32} & a_{33} \\ 2a_{21} & 2a_{22} & 2a_{23} \\ a_{11} & a_{12} & a_{13} \end{bmatrix}$?

Your Answer:Correct Answer: -6Not AttemptedTime taken: 00min 00secDiscuss

Q #3

Multiple Choice Type

Award: 1

Penalty: 0.33

Engineering Mathematics

Let $\mathbf{u} = \begin{bmatrix} 4 \\ 1 \\ 3 \end{bmatrix}$, $\mathbf{v} = \begin{bmatrix} 2 \\ 5 \\ -1 \end{bmatrix}$, and $\mathbf{w} = \begin{bmatrix} -4 \\ 17 \\ -13 \end{bmatrix}$.

It can shown that $3\mathbf{u} - 4\mathbf{v} + \mathbf{w} = \mathbf{0}$. Use this fact to find a solution to the system $A\mathbf{x} = \mathbf{b}$ where

$$A = \begin{bmatrix} 2 & 4 \\ 5 & 1 \\ -1 & 3 \end{bmatrix}, \quad \mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}, \quad \text{and } \mathbf{b} = \begin{bmatrix} -4 \\ 17 \\ -13 \end{bmatrix}$$

A. $\mathbf{x} = \begin{bmatrix} 3 \\ -4 \end{bmatrix}$

B. $\mathbf{x} = \begin{bmatrix} -4 \\ 3 \end{bmatrix}$

C. $\mathbf{x} = \begin{bmatrix} 4 \\ -3 \end{bmatrix}$

D. $\mathbf{x} = \begin{bmatrix} -3 \\ 4 \end{bmatrix}$

Your Answer:

Correct Answer: C

Not Attempted

Time taken: 00min 00sec

Discuss

Q #4

Multiple Select Type

Award: 1

Penalty: 0

Engineering Mathematics

A, B and C are arbitrary, non-singular matrices. $\det(A^T B)$ must equal which of the following?

A. $\det(A) \det(B)$

B. $\frac{\det(B)}{\det(A)}$

C. $\det(A^{-1}) \det(B)$

D. $\frac{\det(B)}{\det(A^{-1})}$

Your Answer:

Correct Answer: A;D

Not Attempted

Time taken: 00min 00sec

Discuss

Q #5

Multiple Choice Type

Award: 1

Penalty: 0.33

Engineering Mathematics

Which of the following vectors are eigenvectors of the matrix: $\begin{bmatrix} 1 & 3 & 6 \\ 2 & 1 & 4 \\ 1 & 0 & 3 \end{bmatrix}$

A. $\begin{bmatrix} 1 \\ 3 \\ -2 \end{bmatrix}$

B. $\begin{bmatrix} -2 \\ -2 \\ 1 \end{bmatrix}$

C. $\begin{bmatrix} 0 \\ 1 \\ -5 \end{bmatrix}$

D. None of these

Your Answer:

Correct Answer: B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #6

Multiple Choice Type

Award: 1

Penalty: 0.33

Engineering Mathematics

A sequence of independent experiments is conducted. Each experiment succeeds with probability p , fails with probability q , and has a neutral outcome with probability $1 - p - q$. The sequence terminates as soon as some experiment succeeds or fails. Let X be the number of experiments conducted. Let S be the event that the outcome of the last experiment is a success. What is the conditional expectation of X given S ?

- A. $p/(p + q)$
- B. $q/(p + q)$
- C. $1/(p + q)$
- D. $pq/(p + q)$

Your Answer:

Correct Answer: C

Not Attempted

Time taken: 00min 00sec

Discuss

Q #7

Numerical Type

Award: 1

Penalty: 0

Engineering Mathematics

Landon is 80% sure he forgot his textbook either at the Union or in Monteith. He is 40% sure that the book is at the union, and 40% sure that it is in Monteith. Given that Landon already went to Monteith and noticed his textbook is not there, what is the probability that it is at the Union (round off to two decimal places)?

Your Answer:

Correct Answer: 0.67

Not Attempted

Time taken: 00min 00sec

Discuss

Q #8

Multiple Choice Type

Award: 1

Penalty: 0.33

Probability

Let X be a random variable with the density function:

$$f(x) = \begin{cases} 3x^2 & 0 \leq x \leq 1 \\ 0 & \text{else} \end{cases}$$

Find the density function $f_Y(y)$ of $Y = X^2$.

- A. $f_Y(y) = \begin{cases} \frac{3}{2}\sqrt{y} & 0 < y < 1 \\ 0 & \text{else} \end{cases}$
- B. $f_Y(y) = \begin{cases} 3\sqrt{y} & 0 < y < 1 \\ 0 & \text{else} \end{cases}$
- C. $f_Y(y) = \begin{cases} \frac{3}{2y} & 0 < y < 1 \\ 0 & \text{else} \end{cases}$
- D. $f_Y(y) = \begin{cases} \frac{3}{2}y^2 & 0 < y < 1 \\ 0 & \text{else} \end{cases}$

Your Answer:

Correct Answer: A

Not Attempted

Time taken: 00min 00sec

Discuss

Q #9

Multiple Choice Type

Award: 1

Penalty: 0.33

Mathematical Logic

What does the following limit evaluate to?

$$\lim_{t \rightarrow 0} \frac{\sin t - t}{t^3}$$

- A. $-1/6$
- B. $1/6$
- C. $-1/3$
- D. $1/3$

Your Answer:

Correct Answer: A

Not Attempted

Time taken: 00min 00sec

Discuss

Q #10

Numerical Type

Award: 1

Penalty: 0

Engineering Mathematics

Suppose that f is continuous and differentiable on the interval $[1,6]$. Also suppose that $f(1) = -8$ and $f'(x) \leq 4$ for all x in the interval $[1, 6]$. What is the largest possible value for $f(6)$?

Your Answer:

Correct Answer: 12

Not Attempted

Time taken: 00min 00sec

Discuss

Q #11

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

Let a, b be in \mathbb{R} . Consider the three vectors

$$\boldsymbol{v}_1 = \begin{bmatrix} a \\ 0 \\ 0 \end{bmatrix}, \quad \boldsymbol{v}_2 = \begin{bmatrix} 0 \\ b \\ 1 \end{bmatrix}, \quad \boldsymbol{v}_3 = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}.$$

For which values of a and b are $\boldsymbol{v}_1, \boldsymbol{v}_2, \boldsymbol{v}_3$ independent?

- A. $a = 0$ and $b = 1$
- B. $a \neq 0$ and $b \neq 1$
- C. $a = 0$ and $b \neq 1$
- D. $a \neq 0$ and $b = 1$

Your Answer:

Correct Answer: B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #12

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

- S1 : A set of two vectors in \mathbb{R}^n is Linealy dependent if at least one vector is a multiple of the other.
- S2 : A set of n vectors in \mathbb{R}^n is Linealy independent if and only if none of the vectors are a multiple of any other vector.
- A. S1 and S2 both are correct
 - B. S1 is correct and S2 is incorrect

C. S2 is correct and S1 is incorrect

D. S1 and S2 both are incorrect

Your Answer:

Correct Answer: B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #13

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

Suppose A is 3 by 4, and $Ax = 0$ has all solutions in the following form -

$$\mathbf{x} = s \begin{bmatrix} 1 \\ 1 \\ 1 \\ 0 \end{bmatrix} + t \begin{bmatrix} -2 \\ -1 \\ 0 \\ 1 \end{bmatrix}$$

We do some unknown elementary row transformations on A and get the following matrix R -

$$R = \begin{bmatrix} 1 & 0 & a & b \\ 0 & 1 & c & d \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

What will be the values of a, b, c , and d ?

A. $a = -1$

B. $b = 2$

C. $c = -1$

D. $d = 1$

Your Answer:

Correct Answer: A;B;C;D

Not Attempted

Time taken: 00min 00sec

Discuss

Q #14

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

Consider the vectors $\mathbf{u} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$, $\mathbf{v} = \begin{bmatrix} 1 \\ c^2 \end{bmatrix}$, $\mathbf{b} = \begin{bmatrix} 1 \\ c \end{bmatrix}$, where c is a constant.

Consider two statements.

S1 : $c = 1$ is the ONLY possibility where b is a linear combination of u and v .

S2 : $c = -1$ is the ONLY possibility where b is NOT a linear combination of u and v .

Which of the following is/are true?

A. S1 is correct but S2 is incorrect

B. S1 is incorrect but S2 is correct

C. Both are correct

D. Both are incorrect

Your Answer:

Correct Answer: B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #15

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

Which of the following is/are TRUE ?

- A. Suppose an $m \times n$ matrix A has n pivot columns. Then for each $\mathbf{b} \in \mathbb{R}^m$, the equation $A\mathbf{x} = \mathbf{b}$ has at most one solution.
- B. Suppose $Ax = b$ has the solution, the solution unique solution if and only if $Ax = 0$ has unique solution.
- C. If A is an $m \times n$ matrix and $Ax = 0$ has a unique solution, then $Ax = b$ is consistent for every b in \mathbb{R}^m .
- D. If for some matrix A , and some vectors x and b , we have $Ax = b$, then b is linear combination of columns of A .

Your Answer:

Correct Answer: A;B;D

Not Attempted

Time taken: 00min 00sec

Discuss

Q #16

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

Consider the matrices A and R given below.

$$A = \begin{bmatrix} 1 & 2 & 1 & b \\ 2 & a & 1 & 8 \\ \star & \star & \star & \star \end{bmatrix}, \quad R = \begin{bmatrix} 1 & 2 & 0 & 3 \\ 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

- Suppose we get R after performing some unknown elementary row operations on A . What will be the value of a and b ?
- A. $a = 2, b = 5$
 - B. $a = 0, b = 3$
 - C. $a = 4, b = 5$
 - D. None of these

Your Answer:

Correct Answer: C

Not Attempted

Time taken: 00min 07sec

Discuss

Q #17

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

- If the characteristic polynomial of A is $= \lambda^2(\lambda - 3)^4$, then the $\text{rank}(A)$ could be
- A.3
 - B.4
 - C.5
 - D.6

Your Answer:

Correct Answer: B;C

Not Attempted

Time taken: 00min 00sec

Discuss

Q #18

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

- Which of the following is/are FALSE ?
- A.Let A be an $m \times n$ matrix, and assume that the matrix A has a pivot in every column. Additionally, assume $A\vec{v} = A\vec{w}$ for some vectors $\vec{v}, \vec{w} \in \mathbb{R}^n$. Then $\vec{v} = \vec{w}$.
 - B.If A and B are both invertible $n \times n$ matrices, then AB is invertible.

C.Let A be an $m \times n$ matrix. Then, the homogeneous equation $A\vec{x} = \vec{0}$ is consistent if and only if the augmented matrix $[A \mid \vec{0}]$ has a pivot in every row.

D.Let A be a 3×2 matrix and B a 2×3 matrix. Then the determinant of AB MUST be zero.

Your Answer:

Correct Answer: C

Not Attempted

Time taken: 00min 00sec

Discuss

Q #19

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

- Which one of the following statements is NOT correct?
- A.An eigenvalue of A is a scalar λ such that $A - \lambda I$ is not invertible.
- B.An eigenvalue of A is a scalar λ such that $(A - \lambda I)v = 0$ has a solution.
- C.An eigenvalue of A is a scalar λ such that $Av = \lambda v$ for a nonzero vector v .
- D.An eigenvalue of A is a scalar λ such that $\det(A - \lambda I) = 0$.

Your Answer:

Correct Answer: B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #20

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

- Let A be $n \times n$ matrix with real coefficients. Which of the following is/are true?
- A.A must have an even number of non-real eigenvalues.
- B.If $v_1, v_2 \in \mathbb{R}^n$ are eigenvectors of A with different eigenvalues $\lambda_1 \neq \lambda_2$, then v_1 and v_2 are linearly independent.
- C.If $v_1, v_2 \in \mathbb{R}^n$ are eigenvectors of A with different eigenvalues $\lambda_1 \neq \lambda_2$, then v_1 and v_2 are orthogonal.
- D.The eigenvalues of AB are the product of the eigenvalues of A and B .

Your Answer:

Correct Answer: A;B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #21

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

- It is known that $A \in \mathbb{R}^{3 \times 3}$ has eigenvalues $\lambda_1 = 0, \lambda_2 = 1, \lambda_3 = 2$.
- Which of the following is true?
- A.Linear system $Ax = b$ always has solution for any b
- B.Linear system $Ax = b$ has solution for some $b \neq 0$
- C.Linear system $Ax = b$ can not have solution for any non zero b
- D.Linear system $Ax = b$ has solution iff $b = 0$.

Your Answer:

Correct Answer: B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #22

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

For any real numbers a, b, c , let $A = \begin{bmatrix} 1 & a & b \\ -a & 1 & c \\ -b & -c & 1 \end{bmatrix}$ and let $B = \begin{bmatrix} 0 & a & b \\ -a & 0 & c \\ -b & -c & 0 \end{bmatrix}$. Which of the following is/are true ?

A. A is invertible for all values of a, b, c .

B. B is not invertible for any values of a, b, c .

C. B is invertible for all values of a, b, c .

D. A is not invertible for any values of a, b, c .

Your Answer:

Correct Answer: A;B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #23

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

Let A be an $m \times n$ matrix and \mathbf{b} be a vector in \mathbb{R}^m . Which of the following statements implies that the matrix equation $A\mathbf{x} = \mathbf{b}$ is consistent?

A. Every row of A contains a pivot position.

B. $\text{rank } A = n$.

C. $m = n$ and A is invertible.

D. $m < n$

Your Answer:

Correct Answer: A;C

Not Attempted

Time taken: 00min 00sec

Discuss

Q #24

Multiple Select Type

Award: 2

Penalty: 0

Engineering Mathematics

Let A be a 12×9 matrix (i.e., A has 12 rows and 9 columns) and \mathbf{b} be a vector in \mathbb{R}^{12} . We know that the matrix equation $A\mathbf{x} = \mathbf{b}$ has infinitely many solutions. Which of the following statements are false?

A. \mathbf{b} can be written as a linear combination of the columns of A .

B. Every row of A has a pivot position.

C. The columns of A are linearly dependent.

D. $\text{rank } A \geq 9$.

Your Answer:

Correct Answer: B;D

Not Attempted

Time taken: 00min 00sec

Discuss

Q #25

Numerical Type

Award: 2

Penalty: 0

Engineering Mathematics

Let A be 5×4 matrix. If all solutions of $A\mathbf{x} = \mathbf{0}$ are scalar multiple of one nonzero vector then what will be the rank of A ?

Your Answer:

Correct Answer: 3

Not Attempted

Time taken: 00min 00sec

Discuss

Q #26

Numerical Type

Award: 2

Penalty: 0

Engineering Mathematics

Let X and Y be independent random variables with $E[X] = 1$, $\text{Var}(X) = 3$, $E[Y] = 1$, and $\text{Var}(Y) = 2$. What is $E[(X + Y)^2]$?

Your Answer:

Correct Answer: 9

Not Attempted

Time taken: 00min 00sec

Discuss

Q #27

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

Suppose you are taking a multiple-choice test with c choices for each question. In answering a question on this test, the probability that you know the answer is p . If you don't know the answer, you choose one at random. What is the probability that you knew the answer to a question, given that you answered it correctly?

- A. p
- B. $\frac{p}{p/c+1-p}$
- C. $\frac{p}{p+(1-p)/c}$
- D. $\frac{p}{1-p}$

Your Answer:

Correct Answer: C

Not Attempted

Time taken: 00min 00sec

Discuss

Q #28

Multiple Choice Type

Award: 2

Penalty: 0.67

Engineering Mathematics

Suppose that buses are scheduled to arrive at a bus stop at noon but are always X minutes late, where X is an exponential random variable with probability density function $f_X(x) = \lambda e^{-\lambda x}$. Suppose that you arrive at the bus stop precisely at noon. Suppose that you have already waiting for 10 minutes. Compute the probability that you have to wait an additional five minutes or more.

- A. $e^{-15\lambda}$
- B. $e^{-5\lambda}$
- C. $e^{-10\lambda}$
- D. None of the above

Your Answer:

Correct Answer: B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #29

Multiple Select Type

Award: 2

Penalty: 0

Probability

In $n + m$ independent Bernoulli (p) trials, let S_n be the number of successes in the first n trials and T_m the number of successes in the last m trials. Then which of the following statement(s) is/are true?

- A. The distribution of S_n is Binomial.
- B. The distribution of T_n is Binomial.
- C. The distribution of $S_n + T_n$ is not Binomial.
- D. S_n and T_n are dependent.

Your Answer:

Correct Answer: A;B

Not Attempted

Time taken: 00min 00sec

Discuss

Q #30

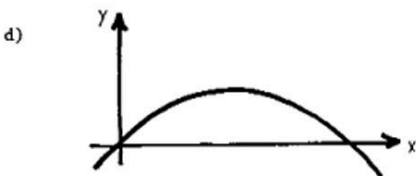
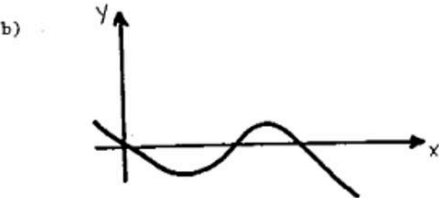
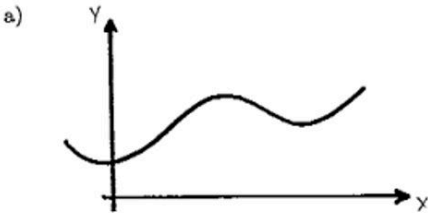
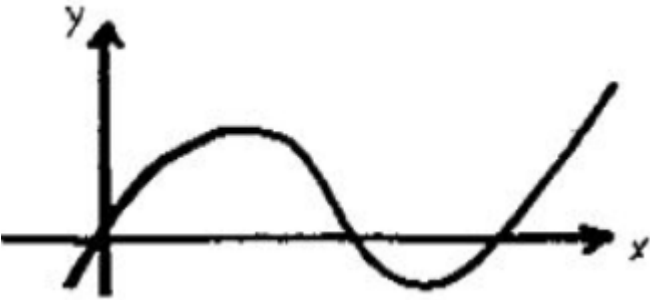
Multiple Choice Type

Award: 2

Penalty: 0.67

Mathematical Logic

If the graph of $f'(x)$ is shown below, then which of the following could be the graph of $f(x)$?



Your Answer:

Correct Answer: A

Not Attempted

Time taken: 00min 00sec

Discuss