Unit 7 - Week 6

Week 6 Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1) Consider the following statements regarding CTCS (central time central space) scheme.
(i) CTCS scheme is unconditionally stable
(ii) CTCS scheme is conditionally stable
(iii) CTCS scheme is unconditionally unstable
(iv) CTCS scheme is more accurate than FTCS (forward time central space) scheme.
Which of the above statements are correct?
(a) (i) and (iv) only
(b) (ii) and (iv) only
(c) (iii) and (iv) only
(d) (i) only

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

2) Consider the following statements regarding Dufort-Frankel scheme.
(i) Dufort-Frankel scheme is unconditionally stable and inconsistent
(ii) Dufort-Frankel scheme is conditionally stable and inconsistent
(iii) Dufort-Frankel scheme is unconditionally unstable and inconsistent
(iv) Dufort-Frankel scheme is unconditionally unstable and consistent
Which of the above statements are correct?
(a) (i) only
(b) (ii) only
(c) (iii) only
(d) (iv) only

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

3) 

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

Due on 2018-09-12, 23:59 IST.
Consider the following statements pertaining to the solution for a system of linear algebraic homogeneous equations.

(i) Solution is trivial when the determinant of the coefficient matrix is not equal to zero.
(ii) Solution is trivial when the determinant of the coefficient matrix is equal to zero.
(iii) Infinite number of solutions exist when the determinant of the coefficient matrix is equal to zero.
(iv) Infinite number of solutions exist when the determinant of the coefficient matrix is not equal to zero.

Which of the above statements are correct?
(a) (i) only
(b) (ii) only
(c) (i) and (iii)
(d) (ii) and (iv)

A system of linear algebraic equations is given below

\[5x + 3y + 7z = 4\]
\[3x + 26y + 2z = 9\]
\[7x + 2y + 10z = 5\]

Which one of the following is correct?
(a) The equations are consistent and infinite number of solutions exist
(b) The equations are consistent and there is unique solution
(c) The equations are inconsistent
(d) Only trivial solution exists
A system of linear algebraic equations is given below

\[ \begin{align*}
2x + 3y + 5z &= 9 \\
7x + 3y - 2z &= 8 \\
2x + 3y + \lambda z &= \mu 
\end{align*} \]

where \( \lambda \) and \( \mu \) are two unknowns. If the above equations will have unique solution when

(a) \( \lambda = 5 \) and \( \mu = 9 \)
(b) \( \lambda = 5 \) and \( \mu \neq 9 \)
(c) \( \lambda \neq 5 \) and \( \mu \) is any value
(d) \( \lambda \) is any value and \( \mu \neq 9 \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c)

A system of linear algebraic equations is given below

\[ \begin{align*}
(3k - 8)x + 3y + 3z &= 0 \\
3x + (3k - 8)y + 3z &= 0 \\
3x + 3y + (3k - 8)z &= 0 
\end{align*} \]

The values of \( k \) for which the system of equations has a non-trivial solution are

(a) \( k = 1/3, 10/3 \)
(b) \( k = 2/3, 11/3 \)
(c) \( k = 4/3, 16/3 \)
(d) \( k = 5/3, 20/3 \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)

For Gaussian elimination method, what is the order of number of operation for forward elimination and backward substitution? if the size of coefficient matrix is

(a) \( n^3 \) and \( n^2 \)
(b) \( n^2 \) and \( n^2 \)
(c) \( n^3 \) and \( n^3 \)
(d) \( n \) and \( n^3 \)

No, the answer is incorrect.
Score: 0
The goal of forward elimination steps in the Gaussian elimination method is to reduce the coefficient matrix to:

(a) a diagonal matrix
(b) an identity matrix
(c) a lower triangular matrix
(d) an upper triangular matrix

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a)
(b)
(c)
(d)

Division by zero during forward elimination steps in Gaussian elimination of the set equations $Ax=b$ implies the coefficient matrix $A$:

(a) is invertible
(b) is nonsingular
(c) may be singular or nonsingular
(d) is singular

No, the answer is incorrect.
Score: 0

Accepted Answers:
(c)