Assignment 5

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

Due on 2023-01-24, 23:59 IST.

1) Which of the following statement is incorrect regarding the given equation \( a + b + 2c = 0 \)?

- Option A: This is Duhamel's equation for free vibration
- Option B: The system is having restoring effect
- Option C: It has been conveniently Duhamel's equation by taking uncertainly in the initial conditions.
- Option D: The system has an uncontrolled solution

Accepted Answers: (A, B, C, D)

2) The system has finite or unlimited solution

3) Which of the following statement is incorrect?

- Option A: Solution of nonlinear equation can be obtained by taking the superposition of the linear equation with time varying coefficient.
- Option B: Solution of nonlinear system can't be extended to another nonlinear systems as no operational rule to not validate for nonlinear systems.
- Option C: (x) is not in complex while using methods of analytical solution for solving Duhamel's equation
- Option D: Duhamel's equation may result in fixed point, periodic or chaotic response depending on the coefficients of the equation and initial conditions.

Accepted Answers: (A, B, C, D)

4) Consider the Duhamel's equation \( (a + b + 2c) = 0 \), if \( a = 2 \) and \( c = 4 \) then the sequence is:

- Option A: \( 2, 4, 2, 0 \)
- Option B: \( 2, 4, 2, 0 \)
- Option C: \( 4, 2, 0 \)
- Option D: \( 2, 4, 2, 0 \)

Accepted Answers: (A, B, C, D)

5) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: In the first system resonance will occur when \( a = 0 \).
- Option B: In the second system, resonance will occur when the external frequency \( \omega = 1 \), \( \omega = 2 \), \( \omega = 3 \), \( \omega = 4 \), \( \omega = 5 \)
- Option C: In the first system, resonance will occur when \( a = 0 \).
- Option D: In the second system, resonance will occur when the external frequency \( \omega = 1 \), \( \omega = 2 \), \( \omega = 3 \), \( \omega = 4 \), \( \omega = 5 \).

Accepted Answers: (A, B, C, D)

6) The Duhamel's equation \( (a + b + 2c) = 0 \), if \( a = 2 \), \( b = 4 \), \( c = 2 \) then the sequence is:

- Option A: \( 2, 4, 2, 0 \)
- Option B: \( 2, 4, 2, 0 \)
- Option C: \( 4, 2, 0 \)
- Option D: \( 2, 4, 2, 0 \)

Accepted Answers: (A, B, C, D)

7) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: With increase in \( a \) for a constant value of \( b \) response amplitude will decrease.
- Option B: With increase in \( a \) for \( b = 0 \), response amplitude is maximum.
- Option C: For \( a = 1 \), response amplitude increases with increase of \( b \) from 0.2 to 0.4
- Option D: For \( a = 1 \), response amplitude tends to zero irrespective of the value of \( b \) and \( c \).

Accepted Answers: (A, B, C, D)

8) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: With increase in \( a \) for a constant value of \( b \) response amplitude will decrease.
- Option B: With increase in \( a \) for \( b = 0 \), response amplitude is maximum.
- Option C: For \( a = 1 \), response amplitude increases with increase of \( b \) from 0.2 to 0.4
- Option D: For \( a = 1 \), response amplitude tends to zero irrespective of the value of \( b \) and \( c \).

Accepted Answers: (A, B, C, D)

9) Consider the Duhamel's equation \( (a + b + 2c) = 0 \), if \( a = 2 \), \( b = 4 \), \( c = 2 \) then the sequence is:

- Option A: \( 2, 4, 2, 0 \)
- Option B: \( 2, 4, 2, 0 \)
- Option C: \( 4, 2, 0 \)
- Option D: \( 2, 4, 2, 0 \)

Accepted Answers: (A, B, C, D)

10) Consider the Duhamel's equation \( (a + b + 2c) = 0 \), if \( a = 2 \), \( b = 4 \), \( c = 2 \) then the sequence is:

- Option A: \( 2, 4, 2, 0 \)
- Option B: \( 2, 4, 2, 0 \)
- Option C: \( 4, 2, 0 \)
- Option D: \( 2, 4, 2, 0 \)

Accepted Answers: (A, B, C, D)

11) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: With increase in \( a \) for a constant value of \( b \) response amplitude will decrease.
- Option B: With increase in \( a \) for \( b = 0 \), response amplitude is maximum.
- Option C: For \( a = 1 \), response amplitude increases with increase of \( b \) from 0.2 to 0.4
- Option D: For \( a = 1 \), response amplitude tends to zero irrespective of the value of \( b \) and \( c \).

Accepted Answers: (A, B, C, D)

12) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: With increase in \( a \) for a constant value of \( b \) response amplitude will decrease.
- Option B: With increase in \( a \) for \( b = 0 \), response amplitude is maximum.
- Option C: For \( a = 1 \), response amplitude increases with increase of \( b \) from 0.2 to 0.4
- Option D: For \( a = 1 \), response amplitude tends to zero irrespective of the value of \( b \) and \( c \).

Accepted Answers: (A, B, C, D)

13) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: With increase in \( a \) for a constant value of \( b \) response amplitude will decrease.
- Option B: With increase in \( a \) for \( b = 0 \), response amplitude is maximum.
- Option C: For \( a = 1 \), response amplitude increases with increase of \( b \) from 0.2 to 0.4
- Option D: For \( a = 1 \), response amplitude tends to zero irrespective of the value of \( b \) and \( c \).

Accepted Answers: (A, B, C, D)

14) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: With increase in \( a \) for a constant value of \( b \) response amplitude will decrease.
- Option B: With increase in \( a \) for \( b = 0 \), response amplitude is maximum.
- Option C: For \( a = 1 \), response amplitude increases with increase of \( b \) from 0.2 to 0.4
- Option D: For \( a = 1 \), response amplitude tends to zero irrespective of the value of \( b \) and \( c \).

Accepted Answers: (A, B, C, D)

15) Consider the sequence \( a, b, c \) where \( a = b = c = 0 \), in which the following statement is correct?

- Option A: With increase in \( a \) for a constant value of \( b \) response amplitude will decrease.
- Option B: With increase in \( a \) for \( b = 0 \), response amplitude is maximum.
- Option C: For \( a = 1 \), response amplitude increases with increase of \( b \) from 0.2 to 0.4
- Option D: For \( a = 1 \), response amplitude tends to zero irrespective of the value of \( b \) and \( c \).

Accepted Answers: (A, B, C, D)