Course outline

How to access the portal?

Lecture 16 : Mode Shapes of

Lecture 17 : Mode Shapes

and Response of MDOF

Lecture 18 : Examples on

Lecture 19 : Examples on

 Lecture 20 : Modal Expansion Theorem, Generalized Coord

MDOF (Contd.)

Lecture Materials

Quiz : Assignment 4

Feedback for week 4

DOWNLOAD VIDEOS

Week 5

Week 6

Week 7

Week 8

Solution

Live Session

Text Transcription

Week 0 Assignment 0

Week 1

Week 2

Week 3

Week 4

MDOF

MDOF

Unit 6 - Week 4

a. $\{r\}_{i}^{T}[M]\{r\}_{j} = 1$

b. $\{r\}_{i}^{T}[M]\{r\}_{j} = 0$

c. $\{r\}_i^T[K]\{r\}_j = 1$

d. $\{r\}_i^T[K]\{r\}_j = 0$

Progress Mentor

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1) For i ≠ j which of the following are true

Assignment 4 The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Ask a Question

□ a.

□ b.

_ c.

□ d.

Score: 0

(a.

○ c.

d.

Score: 0

□ a. □ b. _ c. □ d.

Score: 0

_ a. □ b. C. □ d.

Score: 0

a. b. C. d.) b.

b.

d.

No, the answer is incorrect.

the system are

No, the answer is incorrect.

condition is always

No, the answer is incorrect.

dependent on

No, the answer is incorrect.

Accepted Answers:

given as,

No, the answer is incorrect.

and $\{\eta\}$ is given as,

No, the answer is incorrect.

Accepted Answers:

Accepted Answers:

○b.

○ c. ○d.

Score: 0

○ a. ○ b.

○ c. ○ d.

Score: 0

□ a.

□ C. □ d.

Score: 0

○ a. ○ b.

○ c. ○ d.

Score: 0

○ c.

Score: 0

○ a.

Oc. ○ d.

○ a.

○ d.

Score: 0

○a. ○ b. ○ c. \bigcirc d.

Score: 0

b.

○ c.

○ d.

○ c. d.

Score: 0

○ a. Ob.

○ c. ○ d.

Score: 0

No, the answer is incorrect.

No, the answer is incorrect.

Accepted Answers:

a. Diagonal

c. Square

b. Uncoupled

d. Symmetric

Accepted Answers:

No, the answer is incorrect.

Accepted Answers:

No, the answer is incorrect.

No, the answer is incorrect.

of the system are

Accepted Answers:

Accepted Answers:

No, the answer is incorrect.

Accepted Answers:

motion of

No, the answer is incorrect.

No, the answer is incorrect.

expressed in terms of it's

Accepted Answers:

Accepted Answers:

b.

No, the answer is incorrect.

Accepted Answers:

C.

Accepted Answers:

Accepted Answers:

a. 2 and 3

b. 4 and 9

c. 16 and 81

d. None of the above

a. Normal modes

c. Mode shapes

d. Initial conditions

a. Normal modes

c. Mode shapes

a. $\{u\} = [\emptyset] \{\eta\}$

b. $\{\eta\} = [\emptyset]\{u\}$

c. $\{u\} = [\emptyset]^T \{\eta\}$

d. $\{\eta\} = [\emptyset]^T \{u\}$

a. $\{u\} = [M][\emptyset]\{\eta\}$

c. $\{u\} = [\emptyset] \{\eta\}$

is $\binom{1}{2}$. The other mode shape can be

d. $\begin{Bmatrix} 1 \\ 1 \end{Bmatrix}$

a. $\frac{1}{\sqrt{10m}} {1 \choose 2}$

b. $\frac{1}{10m} {1 \choose 2}$

c. $\frac{1}{\sqrt{5m}} \begin{Bmatrix} 1 \\ 2 \end{Bmatrix}$

d. $\frac{1}{5m} {1 \choose 2}$

The equation of motion of a generic 2-dof system is,

a. Coupled differential equation

c. Uncoupled differential equation

d. Uncoupled differential equation

10) Modal expansion theorem states that any arbitrary response of an MDOF system can be

11) The equation obtained after modal analysis of an MDOF system is similar to the equation of

12) The main blue fit of modal analysis is the _____ of the MDOF system.

The mass and stiffness matrices of a 2-dof system is $\begin{bmatrix} m & 0 \\ 0 & 2m \end{bmatrix}$ and $\begin{bmatrix} 2k & -k \\ -k & k \end{bmatrix}$. The mode shapes

b. Coupled algebraic equation

a. Free vibration response

c. Forced vibration response

b. Normal modes

a. SDOF system

b. 2-DOF system

a. simplifying

c. decoupling

b. transforming

a. $\begin{Bmatrix} 1 \\ 1 \end{Bmatrix}$ and $\begin{Bmatrix} 1 \\ 1 6 \end{Bmatrix}$

c. $\begin{Bmatrix} 1 \\ 1 \end{Bmatrix}$ and $\begin{Bmatrix} 1 \\ 1.78 \end{Bmatrix}$

d. $\begin{Bmatrix} 1 \\ -0.28 \end{Bmatrix}$ and $\begin{Bmatrix} 1 \\ 1.6 \end{Bmatrix}$

14) The mass-normalized mode shapes of the system given in Question.13 are

15) The orthogonality of the mode shape exists because the mass and stiffness matrices are,

a. $\frac{1}{\sqrt{1.15m}} \begin{Bmatrix} 1 \\ -0.28 \end{Bmatrix}$ and $\frac{1}{\sqrt{0.6m}} \begin{Bmatrix} 1 \\ 2 \end{Bmatrix}$

b. $\frac{1}{\sqrt{0.6m}} \begin{Bmatrix} 1 \\ 2 \end{Bmatrix}$ and $\frac{1}{\sqrt{7.33m}} \begin{Bmatrix} 1 \\ 1.78 \end{Bmatrix}$

d. $\frac{1}{\sqrt{m}} \begin{Bmatrix} 1 \\ 1 \end{Bmatrix}$ and $\frac{1}{\sqrt{2.2m}} \begin{Bmatrix} 1 \\ 1.6 \end{Bmatrix}$

c. $\frac{1}{\sqrt{1.15m}} \begin{Bmatrix} 1 \\ -0.28 \end{Bmatrix}$ and $\frac{1}{\sqrt{7.33m}} \begin{Bmatrix} 1 \\ 1.78 \end{Bmatrix}$

b. $\begin{cases} 1 \\ -0.28 \end{cases}$ and $\begin{cases} 1 \\ 1.78 \end{cases}$

d. none of the above

c. Spring-mass system

d. None of the above

d. None of the above

d. $\{u\} = [\emptyset]^T \{\eta\}$

b. $\{u\} = [M][\emptyset]^T \{\eta\}$

b. Natural frequencies

Initial conditions

b. Natural frequencies

Accepted Answers:

The first two Eigen-values of the matrix $[M]^{-1}[K]$ are 4 and 9. The two natural frequencies of

The force vibration response of an MDOF system due to an applied load and non-zero initial

The free vibration response of an MDOF system due to a given initial condition is always

5) The modal matrix of an MDOF system is given as [Ø]. The modal matrix is not mass normalized.

The relation between the physical degree of freedom $\{u\}$ and generalized co-ordinate $\{\eta\}$ is

The mass normalized modal matrix of an MDOF system is given as $[\emptyset]$. Relation between $\{u\}$

7) The two lumped masses of a 2-dof system are equal. One of the mode shape of the system

8) In Question.7, assume the masses are equal to 'm'. One of the mass normalized mode shape is,

Due on 2019-09-25, 23:59 IST.

1 point

1 point