DOS 2021 : Finite Elements

Number of participants: 15

1

A finite element model with N degrees of freedom has

✓ N eigenfrequencies and mode shapes	100%	15 votes
2N eigenfrequencies and mode shapes	0%	0 votes
an infinity number of eigenfrequencies and mode shapes	0%	0 votes
It depends on the frequency band and location of the excitation	0%	0 votes

2

The damping matrix for Rayleigh damping is given by

C = constant	0%	0 votes
✓ C = alpha K + beta M	93%	13 votes
C = alpha omega K	7%	1 vote

3

For a global viscous damping model, the modal damping coefficient is

✓ linearly proportional to the frequency	50%	7 votes
inversely proportional to the frequency	29%	4 votes
independent of the frequency	21%	3 votes

4

The use of a constant material loss factor for damping leads to modal damping coefficients

which depend linearly on the frequency and the loss factor	15%	2 votes
✓ which are constant with the frequency equal to the loss factor divided by 2	77%	10 votes
which evolve with the square of the frequency and proportionally to the loss factor	8%	1 vote

5

If a structure is made of a single material with a loss factor eta=0.02, the modal damping coefficient for all modes is equal to

Answer	Percentage	Votes
0.02	0%	0 votes
✓ 0.01	100%	14 votes
0.05	0%	0 votes

6

When using local damping models

the damping matrix in the modal domain remains diagonal	23%	3 votes
✓ the damping matrix in the modal domain is not diagonal	23%	3 votes
✓ the damping matrix can be made diagonal if the damping is small	62%	8 votes
damping can be neglected when solving the equations of motion	8%	1 vote

7

For structures which undergo base excitation, the mode shapes are computed

Answer	Percentage	Votes
✓ With the DOFS fixed where the acceleration is imposed	100%	14 votes
In free-free boundary conditions	0%	0 votes