VIB : Continuous systems

Number of participants: 26

1. A continuous system has

15 correct answers
out of 18 respondents

	as many eigenfrequencies as there are joints in the structure	11%	2 votes
✓	an infinite number of eigenfrequencies	83%	15 votes
	it depends on the frequency band of the excitation signal	6%	1 vote

2. If the length of a bar is divided by 4, its natural frequency corresponding to traction-compression modes is

11 correct answers
out of 21 respondents

	divided by 2	14%	3 votes
	multiplied by 2	14%	3 votes
✓	multiplied by 4	52%	11 votes
	divided by 4	19%	4 votes

3. If the length of a beam is divided by 2, its first natural frequency corresponding to a bending mode shape is

7 correct answers
out of 17 respondents

	divided by 2	6%	1 vote
	multiplied by 2	41%	7 votes
✓	multiplied by 4	41%	7 votes
	divided by 4	12%	2 votes

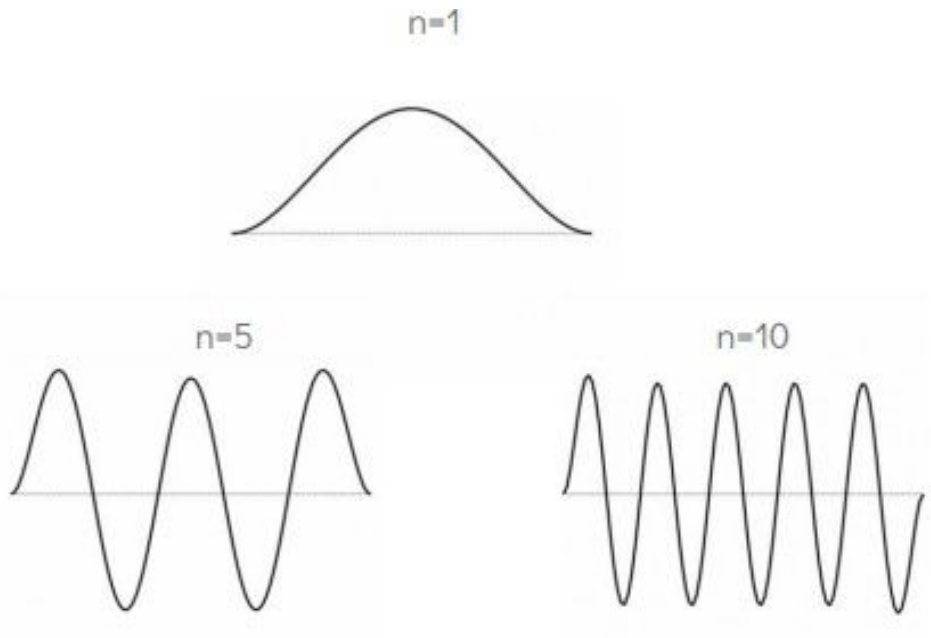
4. If the stiffness of a beam is multiplied by 4, its natural frequencies are

9 correct answers
out of 16 respondents

	multiplied by 4	19%	3 votes
✓	multiplied by 2	56%	9 votes
	divided by 2	13%	2 votes
	multiplied by 16	13%	2 votes

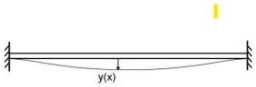
5. From which kind of continuous system are these the modeshapes?

14 correct answers
out of 20 respondents



A simply supported beam — 10% — 2 votes

A cantilevered beam — 20% — 4 votes



A double cantilevered beam — 70% — 14 votes

6. Modal truncation consists in

11 correct answers
out of 18 respondents

✓ computing the response of a system using only the modes which are excited by the external forces	61%	11 votes
computing the response of a system using only the first 5 modes	22%	4 votes
using a truncation of the Fourier series of the excitation signal	17%	3 votes

7. When we truncate, what error do we introduce?

11 correct answers
out of 15 respondents

We change the number of resonance frequencies in the frequency band of interest	27%	4 votes
We change the frequencies of the first 5 modes	0%	0 votes
✓ We ignore the influence of higher frequency modes in the frequency band of interest	73%	11 votes

8. When performing modal truncation, the usual practice consists in

11 correct answers
out of 23 respondents

	taking strictly the number of modes present in the frequency band of interest	22%	5 votes
✓	taking the number of modes in the band [0 1.5*wmax] where wmax is the max frequency of the band of interest	48%	11 votes
	taking the number of modes in the band [0 wmax/1.5] where wmax is the max frequency of the band of interest	30%	7 votes

9. Consider a bar for which the ten first natural frequencies are at 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 Hz. You wish to compute the response using the truncation in the modal basis, from 0 to 5 Hz. How many modes should you use ?

12 correct answers
out of 20 respondents

	5 modes	35%	7 votes
	10 modes	5%	1 vote
✓	8 modes	60%	12 votes