**Answer on Question #41282 - Physics - Mechanics | Kinematics | Dynamics**

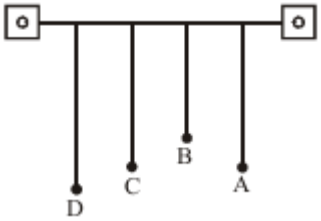
Four pendulums A, B, C and D are suspended from the same elastic support as shown in fig. A and C are of the same length, while B is smaller than A and D is larger than A. If A is given a transverse displacement,

(1) D will vibrate with maximum amplitude.

(2) C will vibrate with maximum amplitude.

(3) B will vibrate with maximum amplitude.

(4) All the four will oscillate with equal amplitude.




**Solution:**

The lengths of pendulums A and C are equal so that their frequencies are also equal.

It is seen that the pendulums B and D execute forced oscillations with very small amplitude, but the amplitude of forced oscillations of pendulum C goes on increasing slowly and becomes equal to the amplitude of A. This is due to the fact that the natural frequency of pendulum C is exactly equal to the natural frequency of pendulum A. Thus the oscillations in C are resonant oscillations and are due to phenomenon of resonance.

**Answer: (2) C will vibrate with maximum amplitude.**