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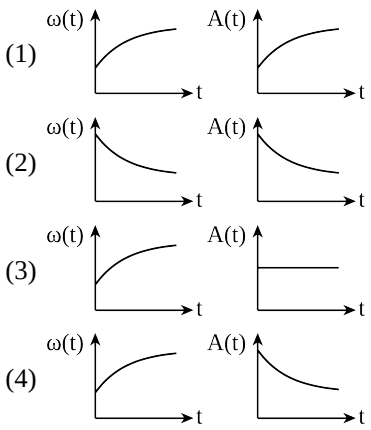
NEET OSCILLATIONS — SPRING–MASS SYSTEMS — PYQS

Max. Marks: 40 **Questions:** 10

Section A (MCQ) — 10 questions

Q.1 In an oscillating spring mass system, a spring is connected to a box filled with sand. As the box oscillates, sand leaks slowly out of the box vertically so that the average frequency ω(t) and average amplitude A(t) of the system change with time t. Which one of the following options schematically depicts these changes correctly?

[NEET (UG) 2025]



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Q.2 Two identical point masses P and Q, suspended from two separate massless springs of spring constants k_1 and k_2, respectively, oscillate vertically. If their maximum speeds are the same, the ratio (A_Q/A_P) of the amplitude A_Q of mass Q to the amplitude A_P of mass P is [NEET (UG) 2025]

(1) $\sqrt{\frac{k_2}{k_1}}$ (2) $\sqrt{\frac{k_1}{k_2}}$ (3) $\frac{k_2}{k_1}$ (4) $\frac{k_1}{k_2}$

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Q.3 A spring is stretched by 5 cm by a force 10 N. The time period of the oscillations when a mass of 2 kg is suspended by it is - [NEET (UG) 2021]

(1) 0.628 s (2) 0.0628 s (3) 6.28 s (4) 3.14 s

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Q.4 A spring of force constant k is cut into lengths of ratio 1:2:3. They are connected in series and the new force constant is k'. Then they are connected in parallel and force constant is k". Then k' : k" is

[NEET 2017]

(1) 1:9 (2) 1:11 (3) 1:14 (4) 1:6

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Q.5 A body of mass m is attached to the lower end of a spring whose upper end is fixed. The spring has negligible mass. When the mass m is slightly pulled down and released, it oscillates with a time period of 3 s. When the mass m is increased by 1 kg, the time period of oscillations becomes 5 s. The value of m in kg is [NEET 2016 (Phase 2)]

(1) $\frac{3}{4}$ (2) $\frac{4}{3}$ (3) $\frac{16}{9}$ (4) $\frac{9}{16}$

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Q.6 The period of oscillation of a mass M suspended from a spring of negligible mass is T. If along with it another mass M is also suspended, the period of oscillation will now be [AIPMT 2010 (Prelims)]

(1) T (2) $\frac{T}{\sqrt{2}}$ (3) 2T (4) $\sqrt{2}T$

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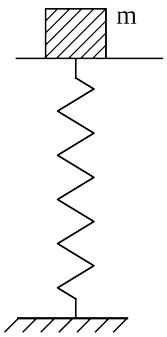
Q.7 A mass of 2.0 kg is put on a flat pan attached to a vertical spring fixed on the ground as shown in the figure. The mass of the spring and the pan is negligible.

When pressed slightly and released the mass executes a simple harmonic motion. The spring constant is 200 N/m. What should be the minimum amplitude of the motion so that the mass gets detached from the pan (take g = 10 m/s^2).

[AIPMT 2007]



(1) 10.0 cm
(2) any value less than 12.0 cm
(3) 4.0 cm
(4) 8.0 cm

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Q.8 Two springs of spring constants k_1 and k_2 are joined in series. The effective spring constant of the combination is given by [AIPMT 2004]

(1) $\sqrt{k_1k_2}$ (2) $(k_1 + k_2)/2$
(3) $k_1 + k_2$ (4) $k_1k_2/(k_1 + k_2)$

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Q.9 The time period of mass suspended from a spring is T. If the spring is cut into four equal parts and the same mass is suspended from one of the parts, then the new time period will be [AIPMT 2003]

(1) T/4 (2) T (3) T/2 (4) 2T

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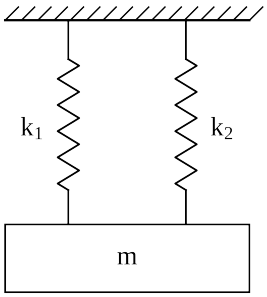
Q.10 A mass is suspended separately by two different springs in successive order, then time periods are t_1 and t_2 respectively. If it is connected by both springs as shown in figure then time period is t_0, the correct relation is [AIPMT 2002]



(1) $t_0^2 = t_1^2 + t_2^2$ (2) $t_0^{-2} = t_1^{-2} + t_2^{-2}$
(3) $t_0^{-1} = t_1^{-1} + t_2^{-1}$ (4) $t_0 = t_1 + t_2$

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	
Ans.	4	2	1	2	4	4	1	4	3	2	