

NEET OSCILLATIONS — SPRING–MASS SYSTEMS — PYQS

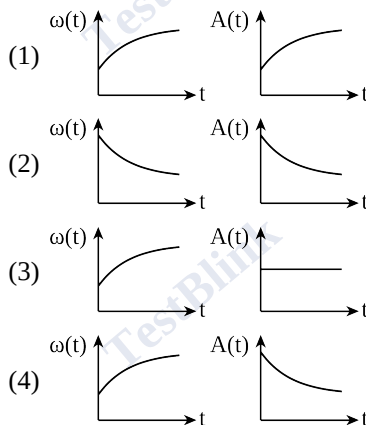
Max. Marks: 40

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 $\omega(t)$ 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) $\sqrt{2}T$

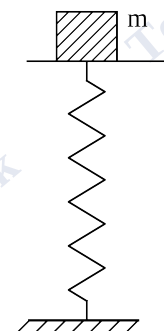
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- Q.7** A mass of 2.0 kg is put on a flat pan attached to a vertical spring fixed on the ground as shown in the figure. The mass of the spring and the pan is negligible.

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 $g = 10 \text{ m/s}^2$).

[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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full solution



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

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full solution



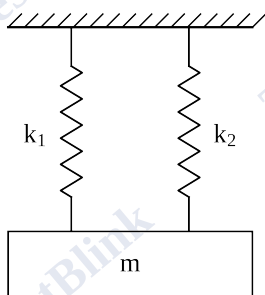
Q.9 The time period of mass suspended from a spring is T . If the spring is cut into four equal parts and the same mass is suspended from one of the parts, then the new time period will be [AIPMT 2003]

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

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full solution



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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full solution



ANSWER KEY

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