

PYQSide

JEE MAIN OSCILLATIONS — SPRING–MASS SYSTEMS — PYQS

Max. Marks: 20

Questions: 5

Section A (MCQ)

- Q.1** The frequency of oscillation of a mass m suspended by a spring is ν_1 . If the length of the spring is cut to half, the same mass oscillates with frequency ν_2 . The value of $\frac{\nu_2}{\nu_1}$ is _____.

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) 1 (2) 2 (3) $\sqrt{2}$ (4) $\sqrt{3}$

Scan or tap for the full solution



- Q.2** A spring stretches by 2 mm when it is loaded with a mass of 200 g. From equilibrium position the mass is further pulled down by 2 mm and released. The frequency associated with the system and maximum energy in the spring are _____ Hz and _____ J, respectively.
(Take $g = 10 \text{ m/s}^2$)

[JEE Main 2026 (Online) 6th April Evening Shift]

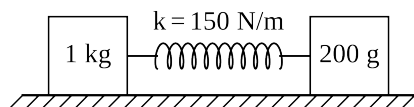
- (1) $\frac{5\sqrt{50}}{\pi}$ and 8×10^{-3}
(2) $\frac{5\sqrt{50}}{\pi}$ and 8
(3) $10\sqrt{50}$ and 2×10^{-3}
(4) $\frac{5\sqrt{50}}{\pi}$ and 16×10^{-3}

Scan or tap for the full solution



- Q.3** As shown in the figure, a spring is kept in a stretched position with some extension by holding the masses 1 kg and 0.2 kg with a separation more than spring natural length and are released. Assuming the horizontal surface to be frictionless, the angular frequency (in SI unit) of the system is :

[JEE Main 2026 (Online) 28th January Evening Shift]



- (1) 20 (2) 5 (3) 30 (4) 27

Scan or tap for the full solution



- Q.4** A spring of force constant 15 N/m is cut into two pieces. If the ratio of their lengths is 1:3, then the force constant of smaller piece is _____ N/m.

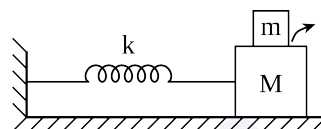
[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) 20 (2) 45 (3) 60 (4) 15

Scan or tap for the full solution



Q.5



Two blocks of masses m and M , ($M > m$), are placed on a frictionless table as shown in figure. A massless spring with spring constant k is attached with the lower block. If the system is slightly displaced and released, then (μ = coefficient of friction between the two blocks)

- A. The time period of small oscillation of the two

$$\text{blocks is } T = 2\pi\sqrt{\frac{(m+M)}{k}}$$

- B. The acceleration of the blocks is $a = -\frac{kx}{M+m}$ (x = displacement of the blocks from the mean position)

- C. The magnitude of the frictional force on the upper block is $\frac{m\mu|x|}{M+m}$

- D. The maximum amplitude of the upper block, if it does not slip, is $\frac{\mu(M+m)g}{k}$

- E. Maximum frictional force can be $\mu(M+m)g$.

Choose the correct answer from the options given below : [JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) B, C, D Only (2) C, D, E Only
(3) A, B, D Only (4) A, B, C Only

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4	5					
Ans.	3	1	3	3	3					