

JEE MAIN OSCILLATIONS — VELOCITY AND ACCELERATION IN SHM — PYQS

Max. Marks: 16
Questions: 4

Section A (MCQ) — 3 questions

- Q.1** The equation of motion of a particle is given by $x = a \sin(50t + \pi/3)$ cm. The particle will come to rest at time t_1 and it will have zero acceleration at time t_2 . The t_1 and t_2 respectively are _____.

[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) $\frac{\pi}{300}$ s, $\frac{\pi}{75}$ s (2) $\frac{\pi}{75}$ s, $\frac{\pi}{300}$ s
 (3) $\frac{\pi}{300}$ s, $\frac{\pi}{25}$ s (4) $\frac{\pi}{50}$ s, $\frac{\pi}{100}$ s

Scan or tap for the full solution



- Q.2** A block of mass 2 kg is attached to one end of a massless spring whose other end is fixed at a wall. The spring-mass system moves on a frictionless horizontal table. The spring's natural length is 2 m and spring constant is 200 N/m. The block is pushed such that the length of the spring becomes 1 m and then released. At distance x m ($x < 2$) from the wall, the speed of the block will be

[JEE Main 2025 (Online) 8th April Evening Shift]

- (1) $10[1 - (2 - x)^2]^{\frac{1}{2}}$ m/s
 (2) $10[1 - (2 - x)^2]^{\frac{3}{2}}$ m/s
 (3) $10[1 - (2 - x)^2]$ m/s
 (4) $10[1 - (2 - x)^2]^2$ m/s

Scan or tap for the full solution



- Q.3** A particle is subjected to two simple harmonic motions as : $x_1 = \sqrt{7} \sin 5t$ cm and $x_2 = 2\sqrt{7} \sin\left(5t + \frac{\pi}{3}\right)$ cm where x is displacement and t is time in seconds. The maximum acceleration of the particle is $x \times 10^{-2} \text{ m s}^{-2}$. The value of x is :

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) $5\sqrt{7}$ (2) 125 (3) $25\sqrt{7}$ (4) 175

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Section B (Numerical) — 1 question

- Q.4** The velocity of a particle executing simple harmonic motion along x -axis is described as $v^2 = 50 - x^2$, where x represents displacement. If the time period of motion is $\frac{x}{7}$ s, the value of x is _____.

[JEE Main 2026 (Online) 4th April Morning Shift]

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ANSWER KEY

Section A (MCQ) — 3 questions

Ques.	1	2	3										
Ans.	1	1	4										

Section B (Numerical) — 1 question

Ques.	4												
Ans.	44												