JEE

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Physics

Oscillations

DPP: 2

Q1 The acceleration of a particle in SHM at $5\ \text{cm}$ from its mean position is $20\ \text{cm/sec}^2$. The value of angular frequency in radians/sec will be:

(A) 2 (B) 4

(C) 10 (D) 14

Q2 The amplitude of a particle in SHM is 5cms and its time period is π. At a displacement of 3cms from its mean position the velocity in cms/sec will be:

(A) 8 (B) 12

(C) 2 (D) 16

Q3 The maximum velocity and acceleration of a particle in S.H.M. are $100\ \text{cm/s}$ and $157\ \text{cm/sec}^2$ respectively. The time period in seconds will be:

(A) 4 (B) 1.57

(C) 0.25 (D) 1

Q4 If the displacement, velocity and acceleration of a particle in SHM are $1\ \text{cm}, 1\ \text{cm/sec}, 1\ \text{cm/sec}^2$ respectively its time period will be (in seconds):

(A) π (B) 0.5π

(C) 2π (D) 1.5π

Q5 The particle is executing S.H.M. on a line 4cms long. If its velocity at mean position is $12\ \text{cm/sec}$, its frequency in Hertz will be:

(A) $\frac{2\pi}{3}$

(B) $\frac{3}{2\pi}$

(C) $\frac{\pi}{2}$

(D) $\frac{3}{\pi}$

Q6 Which of the following statement is incorrect for an object executing S.H.M.:

(A) The value of acceleration is maximum at the extreme points

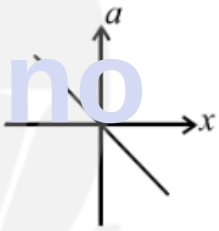
(B) The total work done for completing one oscillation is zero.

(C) The energy changes from one form to another

(D) The velocity at the mean position is zero

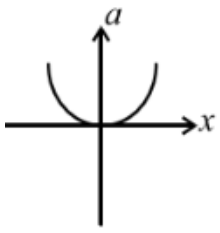
Q7 The variation of acceleration (a) and displacement (x) of the particle executing SHM is indicated by the following curve:

(A)

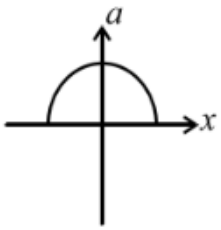


(B)

(C)



(D)



Q8 The time period of an oscillating body executing SHM is 0.05sec and its amplitude is $40\ \text{cm}$. The maximum velocity of particle is:

(A) $16\pi\text{ms}^{-1}$

(B) $2\pi\text{ms}^{-1}$

(C) $3.1\ \text{ms}^{-1}$

(D) $4\pi\text{m/s}$

Q9 A body of mass 5gm is executing S.H.M. about a point with amplitude $10\ \text{cm}$. Its maximum velocity is $100\ \text{cm/sec}$. Its velocity will be $50\ \text{cm/sec}$ at a distance from mean position:

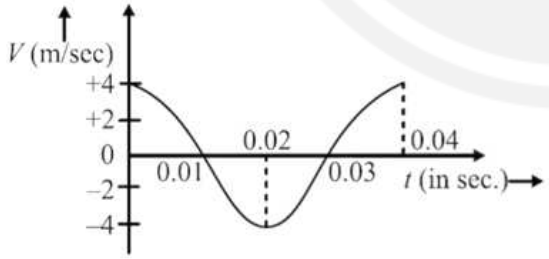
(A) $5\ \text{cm}$

(B) $5\sqrt{2}\ \text{cm}$

(C) $5\sqrt{3}\ \text{cm}$

(D) $10\sqrt{2}\ \text{cm}$

Q10 The velocity-time diagram of a harmonic oscillator is shown in the adjoining figure. The frequency of oscillation is:



(A) $25\ \text{Hz}$

(B) $50\ \text{Hz}$

(C) $12.25\ \text{Hz}$

(D) $33.3\ \text{Hz}$

Q11 A particle is executing S.H.M. of frequency $300\ \text{Hz}$ and with amplitude $0.1\ \text{cm}$. Its maximum velocity will be:

(A) $60\pi\text{cm/s}$

(B) $0.6\pi\text{cm/s}$

(C) $0.50\pi\text{cm/s}$

(D) $0.05\pi\text{cm/s}$

Answer Key

Q1	(A)
Q2	(A)
Q3	(A)
Q4	(C)
Q5	(D)
Q6	(D)
Q7	(A)
Q8	(A)
Q9	(C)
Q10	(A)
Q11	(A)

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