PHYSICS

AAKASH INSTITUTE ENGLISH

MOCK TEST 20

Example

1. The displacement time graph of a particle executing S.H.M as shown in the figure.

 The corresponding force-time graph of the partical will be

A. 

B. 

C. 

D. 

Answer: B

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2. As a body performs SHM, its potential energy U varies with time t as indicated in

A. 

B. 

C. 

D. 

Answer: A

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3. The potential energy of a particle executing S H M is 25 J. when its displacement is half of amplitude. The total energy of the particle is

A. 250 J

B. 180 J

C. 100 J

D. 25 J

Answer: C

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4. In S.H.M

A. Velocity is ahead of displacement by phase angle of π

B. Velocity is ahead of displacement by phase angle of $\frac{\pi}{2}$

C. Acceleration is ahead of displacement by phase angle of $\frac{\pi}{2}$

D. Acceleration is ahead of velocity by phase angle of π

Answer: B

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5. The force of a particle of mass 1 kg is depends on displacement as F = —4x then the frequency of S.H.M. is

A. πHz

B. $2\pi Hz$

C. $\frac{1}{\pi} Hz$

D. $\frac{1}{2\pi} Hz$

Answer: C

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6. The ratio of maximum velocity to the velocity of a particle performing S.H M at a point where potential energy is 25% of total energy is

A. $2:\sqrt{3}$

B. $\sqrt{3}:2$

C. $1:2$

D. $1 : \sqrt{3}$

Answer: A

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7. If the length of a simple pendulum is equal to the radius of the earth, its time period will be

A. $\pi\sqrt{\frac{R}{g}}$

B. $2\pi\sqrt{\frac{R}{g}}$

C. $4\pi\sqrt{\frac{R}{g}}$

D. $2\pi\sqrt{\frac{R}{2}g}$

Answer: D

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8. A simple pendulum with a metallic bob has a time preiod 10 s. The bob is now immersed in a non-viscous liquide of density 1/3 that of metal. the time period of the same pendulum becomes

A. 10 s

B. $\frac{10}{\sqrt{2^s}}$

C. $10\sqrt{\frac{3}{2}}s$

D. $10\sqrt{3}s$

Answer: C

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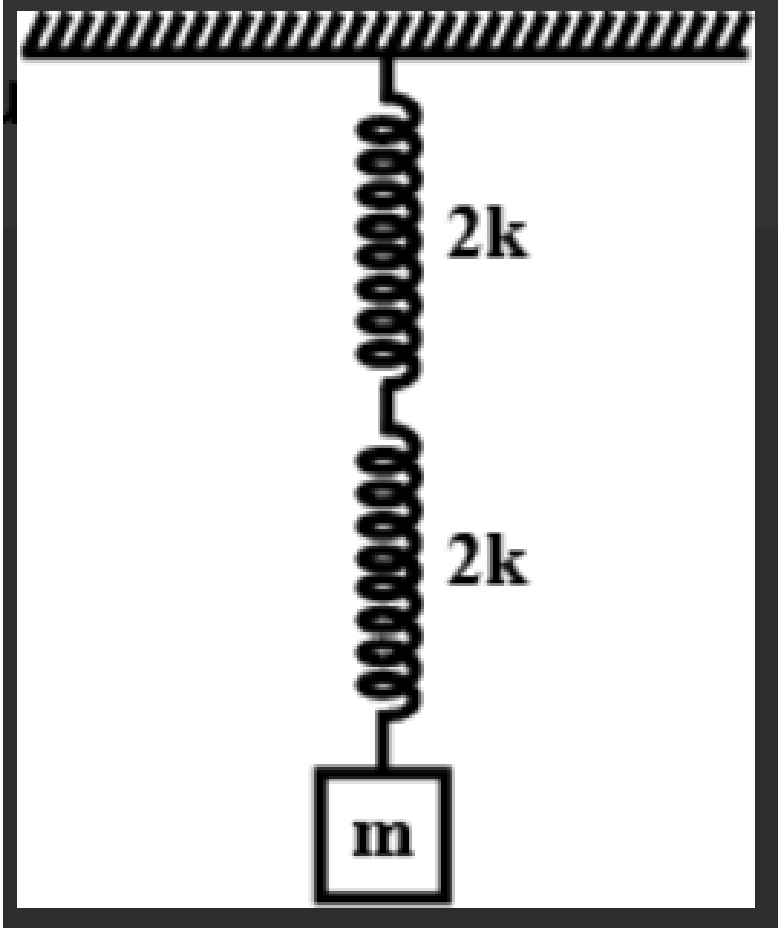
9. The time period of oscillation of the block as shown in figure is



A. $2\pi\sqrt{\frac{m}{2k}}$

B. $\pi\sqrt{\frac{m}{k}}$

C. $4\pi\sqrt{\frac{m}{k}}$

D. $2\pi\sqrt{\frac{m}{k}}$

Answer: D

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10. A simple pendulum of length 5 m is suspended from the ceiling of a cart. Cart is sliding down on a frictionless surface having angle of inclination 60^{o}. The time period of the pendulum is

A. $2\pi s$

B. πs

C. $4\pi s$

D. $\frac{\pi}{2}s$

Answer: A

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11. A weightless spring has a force constant k oscillates with frequency f when a mass m is suspended from it The spring is cut into three equal parts and a mass 3 m is suspended from

it The frequency of oscillation of one part will now become

A. f

B. 2 f

C. f / 3

D. 3 f

Answer: A

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12. A mass M attached to a spring oscillation with a period of $2s$. If the mass is increased by $2kg$, the period increases by 1s, find the initial mass m assuming that Hooke's law is obeyed.

A. 1.6 kg

B. 3.2 kg

C. 6.4 kg

D. 4.8 kg

Answer: A

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13. If a simple pendulum is taken on to the moon from the earth, then it

A. Runs faster

B. Runs slower

C. Shows no change

D. Will not perform S.H.M.

Answer: B

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14. For a spring-mass system spring having spring constant 19.7 N/m is attached to it. What should be the value of mass m (approx.) so that it will give the same period as that of seconds pendulum?

A. 1 kg

B. 2 kg

C. 3 kg

D. 4 kg

Answer: B

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15. Time period of a given spring-mass system is 

A. $2\pi\sqrt{\frac{m}{k}}$

B. $\pi\sqrt{\frac{m}{k}}$

C. $\pi\sqrt{\frac{2m}{k}}$

D. $\pi\sqrt{\frac{m}{2}k}$

Answer: C

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16. For the small damping oscillator, the mass of the block is 500 g and value of spring constant is k = 50 N/m and damping constant is 10`gs^(-1) The time period of oscillation is (approx.)

A. $2\pi s$

B. $\frac{2\pi}{13} s$

C. $\frac{\pi}{5}s$

D. $\frac{\pi}{\sqrt{5}}s$

Answer: C

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17. A uniform solid sphere of mass m and radius R is suspended in vertical plane from a point on its periphery. The time period of its oscillation is

A. $2\pi\sqrt{\frac{r}{g}}$

B. $2\pi\sqrt{\frac{5R}{3g}}$

C. $2\pi\sqrt{\frac{7R}{5g}}$

D. $2\pi\sqrt{\frac{2R}{5g}}$

Answer: C

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18. The amplitude (A) of damped oscillator becomes half in 5 minutes. The amplitude

after next 10 minutes will be

A. A

B. A/8

C. A/4

D. 4A

Answer: B

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19. The total force acting on the mass at any time t, for damped oscillator is given as (where symbols have their usual meanings)

A. $\vec{F} = -k\vec{x}$

B. $\vec{F} = -k\vec{x} - b\vec{v}$

C. $\vec{F} = -k\vec{x} - b\vec{v} + 2\vec{x}$

D. $\vec{F} = -b\vec{v} - bk^2\vec{x}$

Answer: B

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