

India's Number 1 Education App

## PHYSICS

## BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

## SAMPLE PAPER 11 (UNSOLVED)

#### Part I

**1.** Force F is given by  $F = at + bt^2$ . Where "t"

is time. What are the dimensions of "a" and

"cb"?

A. 
$$MLT^{-3}$$
 and  $MLT^{-4}$   
B.  $MLT^{-1}$  and  $MLT^{0}$   
C.  $MLT^{-3}$  and  $MLT^{4}$   
D.  $MLT^{-4}$  and  $MLT$ 

Answer: A



2. Unit of impulse.....

A. Ns

B.  $Ns^{-1}$ 

C. Nm

D.  $Nm^{-1}$ 

Answer: A

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**3.** A ball with an initial momentum 'P' collides normally with a rigid wall. If  $P_1$  is the linear

momentum after the perfectly elastic collision

#### A. $P_1 = P$

.....

- B.  $P_1 = -P$
- C.  $P_1 = -2P$

D. 
$$P_1=2P$$

#### Answer: C

**4.** If a person moving from pole to equator of the earth then the centrifugal force acting on him is

A. increases

B. decreases

C. remains the same

D. increases and then decreases

Answer: A

5. If the potential energy of the particle is  $\alpha - \frac{\beta}{2}x^2$ , then force experienced by the particle is:

A. 
$$F=rac{eta}{2}x^2$$

B. 
$$F=eta x$$

C. 
$$F=~-eta x$$

D. 
$$F=~-~rac{eta}{2}x^2$$

#### Answer: B

**6.** In a simple harmonic oscillation, the acceleration against displacement for one complete oscillation will be.

A. an ellipse

B. a circle

C. a parabola

D. a straight line

Answer: A

7. The ratio of the radii of gyration of a circular disc to that of circular ring, each of same mass and same radius about their axes is

A. 
$$\sqrt{3}: \sqrt{2}$$
  
B.  $1: \sqrt{2}$   
C.  $\sqrt{2}: 1$   
D.  $\sqrt{2}: \sqrt{3}$ 

#### **Answer: B**



8. The average translational kinetic energy of

gas molecules depends on

A. number of moles and T

B. only on T

C. P and T

D. P only

Answer: A

**9.** When a particle oscillates simple harmonically, its potential energy varies periodically. If the frequency of oscillation of the particle is n, the frequency of potential energy variation is.....

A.  $\frac{n}{2}$ 

B.n

C. 2n

D. 4n

#### Answer: C



**10.** A body is floating in a liquid with  $\frac{1}{5}$  of its volume outside the liquid. If the relative density of the body is 0.9, that of the liquid is

A. 
$$0.9 \times 5$$
  
B.  $0.9 \times \frac{5}{4}$   
C.  $0.9 \times \frac{4}{5}$   
D.  $0.9 \times 4$ 

.....

#### Answer: B



11. Two masses  $M_1$  and  $m_2$  are experiencing the same force where  $m_1 < m_2$  the ratio of their acceleration  $\frac{a_1}{a_2}$  is

#### A. 1

B. greater than 1

C. less than 1

D. all of above





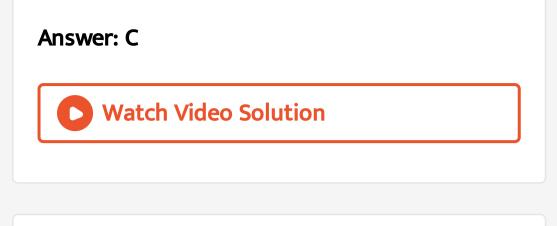
**12.** Boiling water is changing into steam.Under this condition the specific heat of water is

A. zero

B. one

C. infinite

D. less than one



**13.** In an isochoric process we have

A. W =0

B. Q=0

- $\mathrm{C.}\,\Delta U=0$
- D.  $\Delta T=0$

Answer: A

**14.** A particle is executing simple harmonic motion given by  $x = 5\sin\left(4t - \frac{\pi}{6}\right)$ . The velocity of the particle when its displacement is 3 units is many set of the particle when its displacement

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A. 
$$\frac{2\pi}{3}$$
 unit  
B.  $\frac{5\pi}{6}$  units

C. 20 units

#### D. 16 units

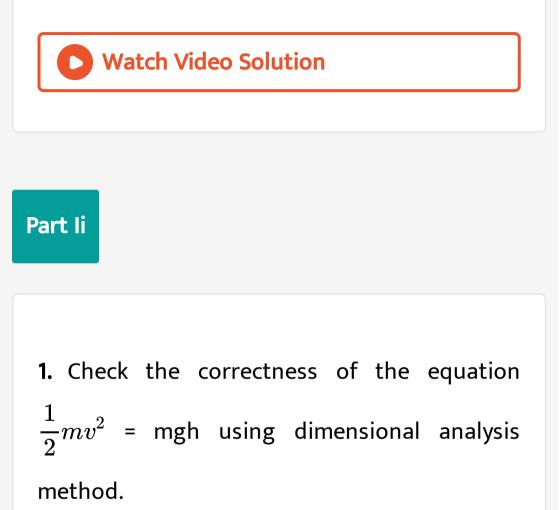
#### Answer: D

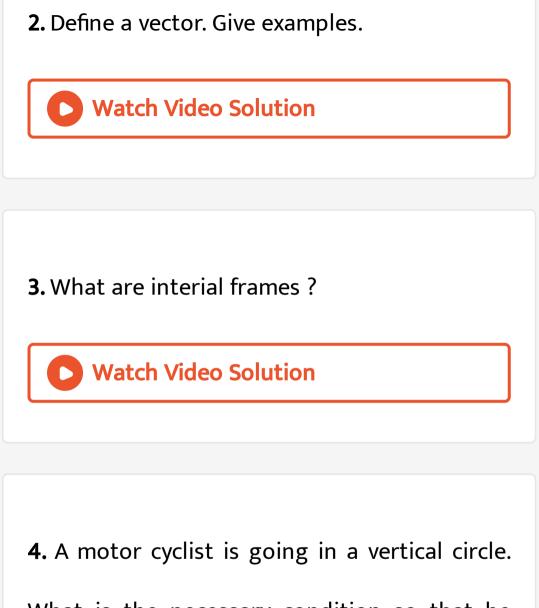


**15.** Compute the distance between anti-node and neighbouring node .

A. 
$$\lambda$$
  
B.  $\frac{\lambda}{2}$   
C.  $\frac{\lambda}{3}$   
D.  $\frac{\lambda}{4}$ 

#### Answer: D





What is the necessary condition so that he

may not fall down?

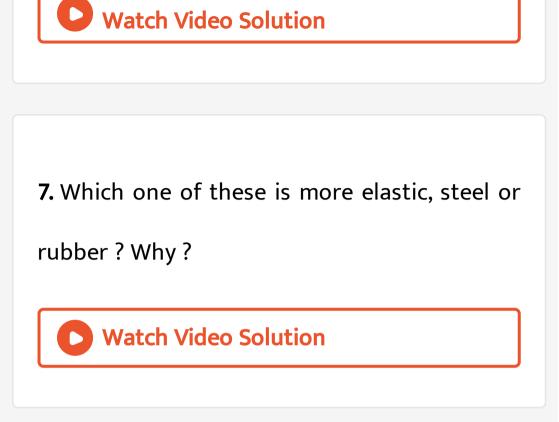
**5.** Two point masses 3 kg and 5 kg are at 4 m and 8 m from the origin on X-axis. Locate the position of center of mass of the two point masses (from the origin and (1) from 3 kg mass.

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6. What happens to the pressure inside a soap

bubble when air is blown into it ?





**8.** Eiffel tower is made up of iron and its height is roughly 300 m. During winter season (January) in France the temperature is  $2^{\circ}$ C and in hot summer its average temperature  $25^{\circ}$ C. Calculate the change in height of Eiffel tower between summer and winter. The linear thermal expansion coefficient for iron  $\alpha = 10 \times 10^{-6}$  per  $^{\circ}C$ Watch Video Solution

**9.** The speed of a wave in a certain medium is 900 m/s. If 3000 waves passes over a certain point of the medium in 2 minutes, then compute its wavelength.





1. Write any two limitations of dimensional

analysis. Give relevant examples.



2. Find the angle between two vectors.

$$A = \hat{i} + 2\hat{j} - \hat{k} \,\, ext{and} \,\, B = \, -4\hat{i} + \hat{j} - 2\hat{k}.$$

**3.** A 40gm of bullet moving at 250ms<sup>-1</sup> stops
after penetrating 20cm of wood. Calculate the
average force by the bullet. ?
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4. Discuss the force - displacement graph for a

spring.

5. A wire of length 2 m with the area of cross section  $10^{-6}m^2$  is used to suspend a load of 980 N. Calculate (i) The stress developed in the wire (ii) the strain and (iii) the energy stored . Given  $Y = 12 \times 10^{10} Nm^{-2}$ .

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6. Obtain the Coefficient of performance (COP).

 $(\beta).$ 



#### 7. State Bernoulli's theorem.



8. Write down the postulates of kinetic theory

of gases.

**9.** The maximum velocity of a particle , executing simple harmonic motion with an amplitude 7mm is  $4.4ms^{-1}$ . The period of oscillation is

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1. Obtain in expression for the time period T of

a simple pendulun. The time period depend

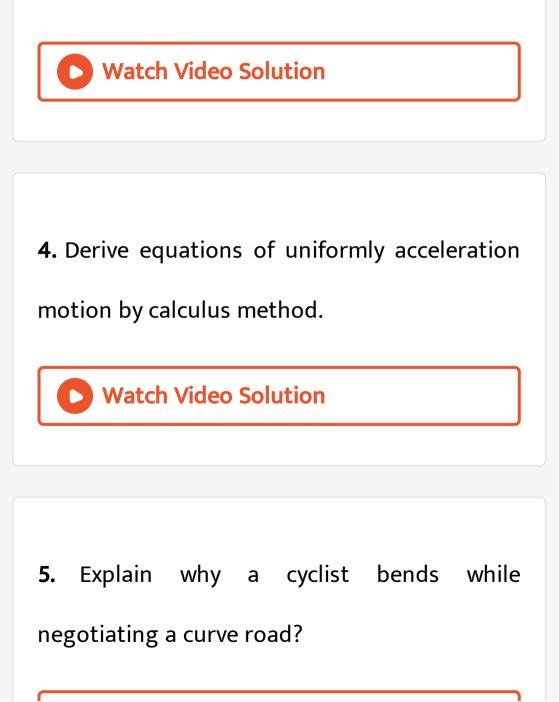
upon (i) mass 'm' of the bob (ii) length 'l' of the pendulum and (iii) acceieration due to gravity g at the place where the pendulum is suspended. (Constant k =  $2\pi$ ) i.e.

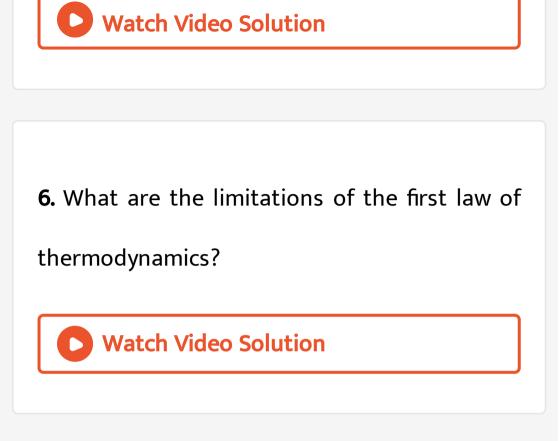
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2. Explain the types of equilibrium with

suitable examples

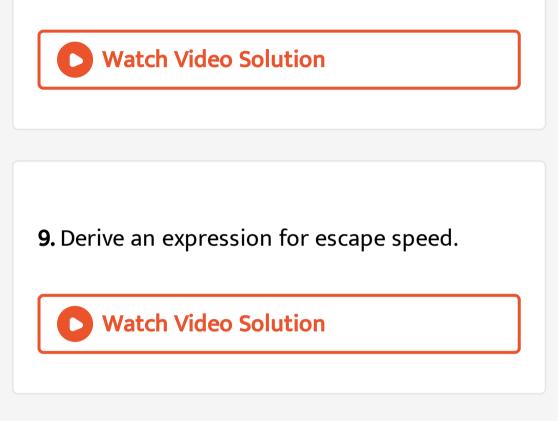
**3.** Explain in detail the triangle law of addition.





**7.** State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlined flow or fluid.

8. Derive Mayer's relation for an ideal gas.



**10.** Explain the different types of modulus of elasticity.



