



PHYSICS

BOOKS - PREMIERS PUBLISHERS

QUESTION PAPER MARCH 2019

Part I

1. What is the angular displacement made by a particle after 5s, when it starts from rest with an angular acceleration 0.2 and s^{-2} ?

A. 4 rad

B.1 rad

C. 2.5 rad

D. 5 rad

Answer:



2. The process in which heat transfer is by actual movement of molecules in fluids such as liquids and gases is called :

- A. Thermal conductivity
- **B.** Convection
- C. Conduction
- D. Radiation

Answer:



3. Which of the following pairs of physical quantities have same dimension?

- A. Torque and Power
- B. Force and Torque
- C. Force and Power
- D. Torque and Energy

Answer:



4. For a satellite moving in an orbit around the

earth, the ratio of kinetic energy of potential

A. 2

B. $\sqrt{2}$ C. $\frac{1}{2}$ D. $\frac{1}{\sqrt{2}}$

Answer:



5. A referigertor has COP of 3 . How much work must be supplied to a refrigertor in order to remove 200J of heart from its interior?

A. 33.33 J

B. 44.44 J

C. 66.67 J

D. 50 J

Answer:

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6. If the temperature of the wire is increased,

then the Young's modulus will

A. increase rapidly

B. increases by very small amount

C. remain the same

D. decrease

Answer:

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7. If the internal energy of an ideal gas U and volume V are doubled, then the pressure of the gas :

A. halves

B. quadruples

C. doubles

D. remains same

Answer:



8. A body of mass 5kg is thrown up vertically with a kinetic energy of 1000J. If acceleration due to gravity is $10ms^{-2}$, find the height at which the kinetic energy becomes half of the

original value.

A. 10 m

B. 20m

C. 50m

D. 100m



9. Define acceleration.









10. In an isochoric process we have

A.
$$\Delta U=0$$

B.
$$\Delta T = 0$$

C. W=0

D. Q=0



11. The amplitude and time period of a simple pendulum bob are 0.05m and 2 s respectively. Then the maximum velocity of the bob is :

A.
$$0.157 m s^{-1}$$

B. $0.257 m s^{-1}$

C. $0.10 m s^{-1}$

D. $0.025 m s^{-1}$



12. A closed cylindrical container is partially filled with water. As the container rotates in a horizontal plane about a perpendicular bisector, its moment of inertia.

A. remains constant

B. depends on the direction of rotation

C. increases

D. decreases

Answer:

13. Which of the following represents a wave?

A.
$$rac{1}{x+vt}$$

B. $\sin(x+vt)$
C. $(x-vt)^3$
D. $x(x+vt)$



14. If the linear momentum of the object in increased by 0.1~% , then the kinetic energy is increased by :

A. 0.4~%

 $\mathsf{B.}\,0.01\,\%$

 $\mathsf{C.}\,0.1\,\%$

D. 0.2~%



15. What is the angular displacement made by a particle after 5s, when it starts from rest with an angular acceleration 0.2 and s^{-2} ?

A. 4 rad

B.1rad

C. 2.5 rad

D. 5 rad



16. In which process heat is transferred directly

from one molecule to other ?

A. Thermal conductivity

B. Convection

C. Conduction

D. Radiation

Answer:

17. Which of the following pairs of physical

quantities have same dimension?

A. Torque and Power

B. Force and Torque

C. Force and Power

D. Torque and Energy

Answer:

18. For a satellite moving in an orbit around the earth, the ratio of kinetic energy of potential



B. $\sqrt{2}$ C. $\frac{1}{2}$

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19. A referigertor has COP of 3. How much work must be supplied to a refrigertor in order to remove 200J of heart from its interior?

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A. 10 m

B. 20m

C. 50m

D. 100m



23. What is uniform motion ?













24. In an isochoric process we have

A.
$$\Delta U=0$$

B.
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A. 0.4~%

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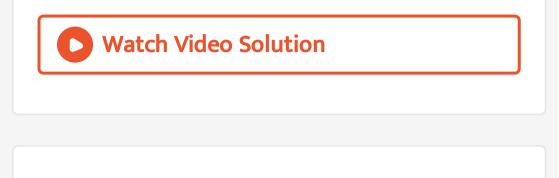
1. Write any two errors of systematic errors.

Explain them.

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2. What is projectile ? Give it's examplees.

3. State newton's second law



4. A car takes a turn with velocity 50 ms^{-1} on the circular road of radius of curvature 10 m. Calculate the centrifugal force experienced by a person of mass 60 kg inside the car?

5. Why is it more difficult to revolve a stone tied to a longer string than a stone tied to a shorter string ?



6. State Stefan-Boltzmann law.



7. What are the factors which effect Brownian

motion?

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8. "Soldiers are not allowed to march on a

bridge". Give reason.



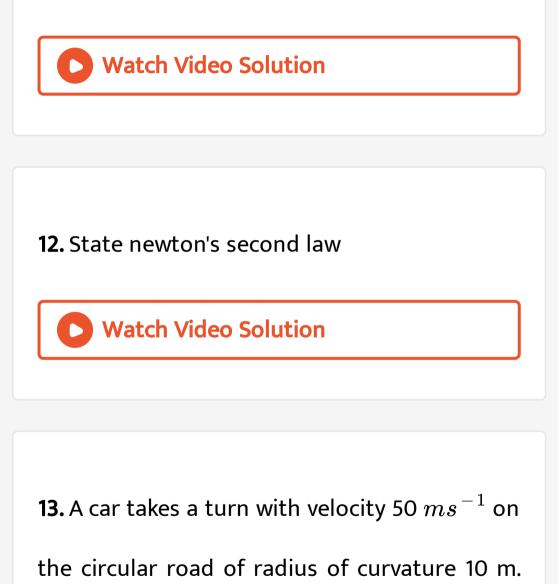
9. The surface tension of a soap solution is $0.03Nm^{-1}$. How much work is done in producing soap bubble of radius 0.05m?



10. Write any two errors of systematic errors.

Explain them.

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a person of mass 60 kg inside the car?

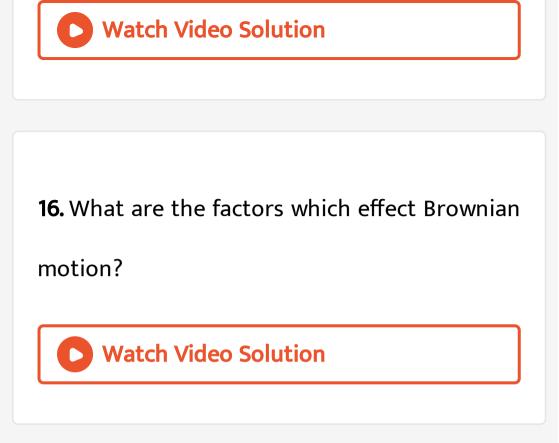


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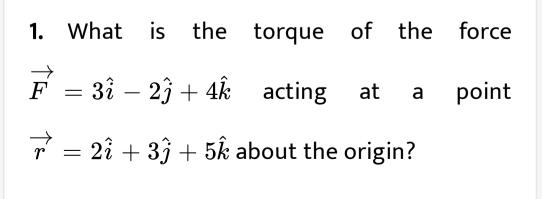
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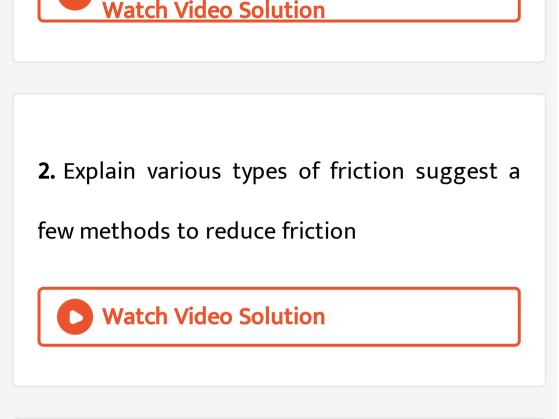
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3. A heavy body and a light body have same momentum. Which one of them has more kinetic energy and why?

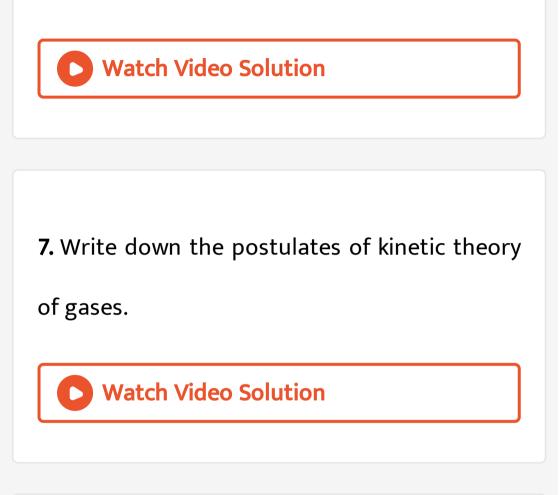
4. Find the rotational kinetic energy of a ring of mass 9 kg and radius 3 m rotating with 240 rpm about an axis passing through its centre and perependicualr to its plane.

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5. Derive an expression for the terminal velocit

of a sphere falling through a viscous liquid.

6. Explain linear expansion of solid.



8. Two waves of wavelength 99cm and 100cm both travelling with the velocity of $396ms^{-1}$

are made to interfere. Calculate the number of

beats produced b then per sec.



- $\stackrel{
 ightarrow}{F}=3\hat{i}-2\hat{j}+4\hat{k}$ acting at a point
- $\overrightarrow{r}=2\hat{i}+3\hat{j}+5\hat{k}$ about the origin?

10. Explain various types of friction suggest a

few methods to reduce friction

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12. Find the rotational kinetic energy of a ring of mass 9 kg and radius 3 m rotating with 240 rpm about an axis passing through its centre and perependicualr to its plane.



13. What do you mean by the term weightlessness ? Explain the state of weightlessness of a freely falling body.

14. Derive an expression for the terminal velocit of a sphere falling through a viscous liquid.



15. Explain linear expansion of solid.

16. Write down the postulates of kinetic theory

of gases.

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17. Two waves of wavelength 99cm and 100cmboth travelling with the velocity of $396ms^{-1}$ are made to interfere. Calculate the number of beats produced *b* then per sec.



1. The force F acting on a body moving in a circular path depends on mass of the body (m) velocity(v) and radius (r) of the circular path. Obtain the expression for the force by dimensional analysis method (k = 1)

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2. State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and

streamlined flow or fluid.

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3. Prove the law of conservation of linear momentum use it to find the recoil velocity of a gun when a bullet is fired from it

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4. State and prove parallel axis theorem

5. What is elastic collision ? Derive an expression for final velocities of two bodies which undergo elastic in one dimension.

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

7. Explain the horizontal oscillations of a spring.
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8. Write down the equation of a freely falling

body under gravity.



9. A ball is thrown vertically upwards with the speed of $19.6ms^{-1}$ from the top of building and reaches the earth in 6 s. Find the height of the building .

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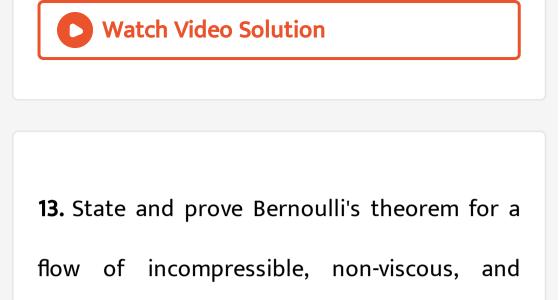
10. Define orbital velocity and establish an

expression for it.

11. Calculate the value of orbital velocity for an artifical satellite of earth orbiting at a height of 1000 km (Mass of the earth $= 6 imes 10^{24}$ kg, radius of the earth = 6400 km)

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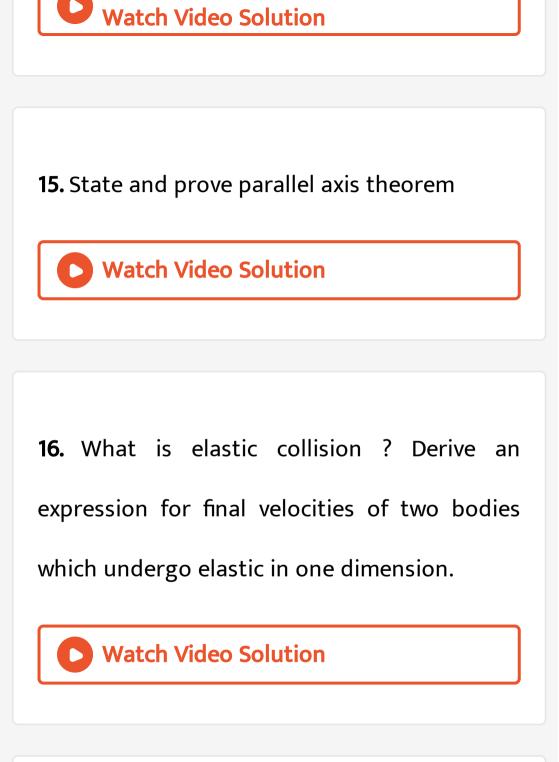


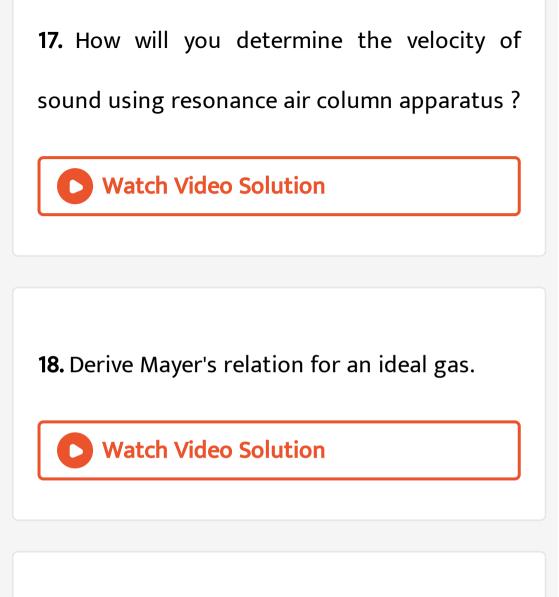
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