PHYSICS

BOOKS - CHHAYA PHYSICS (BENGALI ENGLISH)

QUESTION PAPERS OF WBCHSE -2017

Section I

1. The number of sighificant figures in 6.0025 is

A. 1

B. 4

C. 5

D. 2

Answer:

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2. Which quantity remains unchaged in case of a projectile ?

A. Momentum

B. Kinetic energy

C. vertical component of velocity

D. horizontal component of velocity

Answer:

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3. IF the radii of circular paths of two particles of same masses are in the ratio $1:2$ then , in

order to have the same centripetal force , their velocities should be in the ratio of

A. $1:\sqrt{2}$

B. $\sqrt{2}:1$

C. $4:1$

D. $1:4$

Answer:

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4. Which of the following is not conserved in inelastic collision ?

A. Monentum

B. Kinetic energy

C. both monentum and K. E.

D. none of these

Answer:

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5. Gravitational force is

A. repulsive

B. electrical

C. conservative

D. non-conservative

Answer:

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6. The slope of an isothermal curve is always

A. the same as that of an adiabatic curve

B. greater than that of an adiabatic curve

C. less than that of an adiabatic curve

D. none of these

Answer:

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7. If the tension and diameter of a sonometer wire of fundamental frequency n are doubled

and the density halved , then its fundamental frequency will become

A. $\frac{n}{4}$

B. $\sqrt{2}n$

C. n

D. $\frac{n}{\sqrt{2}}$

Answer:

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Section Ii Group A

1. Determine the unit vector along the vector $\overrightarrow{A} = \hat{i} + 3\hat{j} + 4\hat{k}$.

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2. Write down stoke's law for a small spherical body moving through a viscous fluid terminal velocity :

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Section Ii Group B

1. Define coefficient of static friction and coeficient of kinetic friction .

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2. Calculate the angular speed of a car which rounds a curve of radius 8 m at a speed of 50 km/h .

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3. Show that the surface energy per unit area of a liquid surface is numerically equal to its surface tension .

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4. Define reversible and irreversible processes .

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5. what should be the displacement of a particle exculting SHM so that its $K.E$ is equal to its P.E ?

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6. Show that in SHM the ratio of acceleration and displacement of a particle always remains unchanged .

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Section Ii Group C

1. Estblish the relation between angle of friction and angle of repose .

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2. Explain with reason , whether the coefficient of friction between two surfaces can be zero .

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3. State the work - energy therom .

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4. What is a ' conservative force '? Show that for a conservative force the work done aronund a closed path is zero .

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5. Find the velocity of the centre of mass of two identical particles moving with velocities

v_1 and v_2

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6. Show that in absence of any external forcce the centre of mass of two moving particles moves with uniform velocity .

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7. State the theorem of perpendicular axes of moment of inertia .

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8. The moment of inertia of a uniform circular disc of mass M and radius R about its diameter is $\frac{1}{4}MR^2$. What is the moment if inertia of the disic about an axis passing through its centre and perpendicular to the plane of the disc?

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9. What do you mean by equilibrium of a body ?

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10. there forces $F_1, F_2. F_3$- of which F_2 and F_3 are mutually perpendicular - act on a particle of mass m so that the particle is stationary . Find the acceleration of the particle when F_1 is withdrawn .

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11. Define gravitional constant , state its SI unit

.

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12. Define emissive power of a substance .

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13. Find out the expression for the work done by a gas in adiabatic expansion .

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14. Show that in an adiabatic process the relation between volume and temperature of a gas is $TV^{\gamma-1}$ = constant wherw γ is the ratio of the two specific heats of the gas .

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15. State two fundamental postulates of kinetic theory is ideal gases .

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16. The temperature of a gas is increased from 27° C to 327° C . Show that the rms velocity of the gas molecules at higher temperature is $\sqrt{2}$ times the velocity at the intial temperature .

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17. The volume and pressure of two moles of an ideal gas are V and P respectively . Another 1 mole ideal gas having volume 2V exerts the same pressure P . Molecular mass of the second has is 16 times that of the first gas . compare the rms velocities of two gases .

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Section Ii Group D

1. The displacement of a particle is directly propertional to the third power of time . What will be nature of acceleration of the particle ?

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2. What do you mean by relative velocity ?

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3. A bullet enters a block of wood with a velocity u . Its velocity decreases to v after going through a distance x inside . After civering a further distance y inside , the bullent stops . Prove that $\frac{u}{v} = \sqrt{\frac{y+x}{y}}$

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4. Under what condition is the average velocity of a moving particle equal to its instantaneous velocity ?

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5. Define surface tension .

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6. Write down the mathematical form of Bernoulli's theorem and write the meaning of each term used .

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7. 27 number of droplets having same size are falling through air with the same terminal velocity of $1m.\ s^2$. If the small dropets merge to produce a new drop. What will be the terminal velocity of the new drop ?

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8. What are the SI units of thrust and pressure ?

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9. What is a damped vibration ?

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10. The frequency of a particle vibrating in a medium is f Hz .How many waves are generated in 5 seconds in the medium ?

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11. A tuning fork un air vibrates at 30 Hz with 5 cm amplitude . If the velocity of sound in air is 330 $m.s^{-1}$, derive the expression for the generated travelling wave .

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12. State the laws of transverse vibration of a stretched string .

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13. show that the fundamental frequency of an open pipe is double the fundamental frequency of a closed pipe of the same length .

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14. How much is the separation between two consecutive nodes in a stationary wave ?

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