# PHYSICS

## BOOKS - NTA MOCK TESTS

## NTA JEE MOCK TEST 88

**Physics**

**1.** What is the angular momentum of an electron in Bohr's hydrogen atom whose energy is $-3.4eV$?

A. $\dfrac{5h}{2\pi}$

B. $\dfrac{h}{2\pi}$

C. $\dfrac{h}{\pi}$

D. $\dfrac{2h}{3\pi}$

**Answer: C**

**2.** The mean momentum of a nucleon inside a nucleus with mass number A varies as

A. $A^3$

B. $A^{-\frac{2}{3}}$

C. $A^{-\frac{1}{3}}$
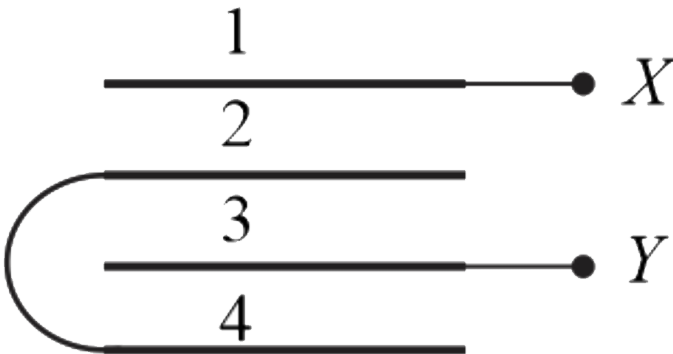
D. $A^{\frac{1}{3}}$

Answer: C

**3.** Four metal plates are arranged as shown in the figure.

Capacitance between X and Y

$(A \rightarrow$ Area of each plate, d $\rightarrow$ distance between the plates)

is



A. $\dfrac{3}{2} \dfrac{\varepsilon_0 A}{d}$

B. $\dfrac{2\varepsilon_0 A}{d}$

C. $\dfrac{2}{3}\dfrac{\varepsilon A}{d}$

D. $\dfrac{3\varepsilon_0 A}{d}$

**Answer: C**

**4.** The primary winding of a transformer has $100$ turns and its secondary winding has $200$ turns. The primary is connected to an ac supply of $120V$ and the current flowing in it is $10A$. The voltage and the current in the secondary are

A. 240 V, 5 A

B. 240 V, 10 A

C. 60 V, 20 A

D. 120 V, 20 A

**Answer: A**

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**5.** The capacitance of a capacitor made by a thin metal foil is $2\mu F$. If the foil is filled with paperr of thickness 0.15 mm, dielectric constant of paper is 2.5 and width of the paper is 400 mm. what is the length of foil?
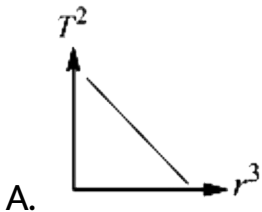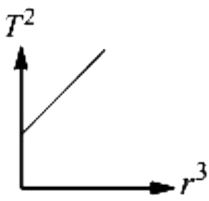
A. 0.34 m

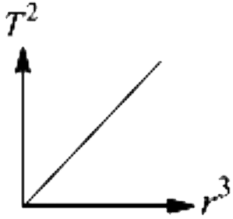B. 1.33 m

C. 13.4 m

D. 33.9 m

**Answer: D**

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**6.** Which of the following graphs between the square of the time period and cube of the distance of the planet from the sun is correct ?
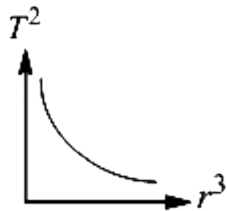
A. 

B.



C.



D.



**Answer: C**

**7.** Two solid spheres A and B made of the same material have radii $r_A$ and $r_B$ respectively . Both the spheres are

cooled from the same temperature under the conditions valid for Newton's law of cooling . The ratio of the rate of change of temperature of A and B is

A. $\dfrac{r_A}{r_B}$

B. $\dfrac{r_B}{r_A}$
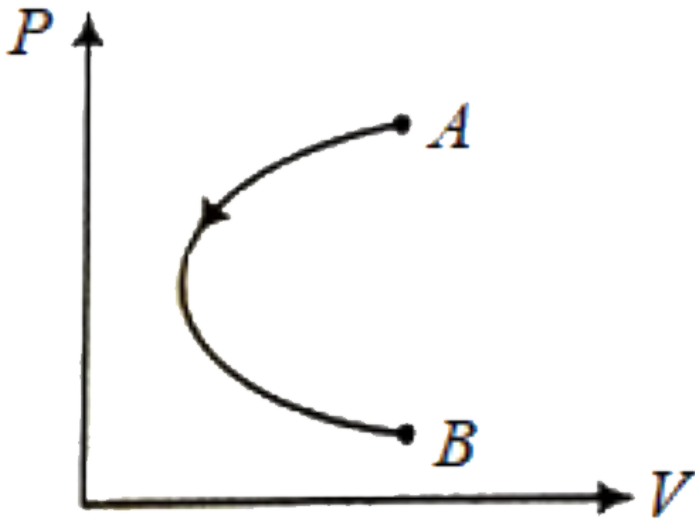
C. $\dfrac{r_A^2}{r_B^2}$

D. $\dfrac{r_B^2}{r_A^2}$

**Answer: B**

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8. P - V diagram of an ideal gas is shown. The gas undergoes from initial state A to final state B such that

initial and final volumes are same. Select the correct alternative for given process AB.



A. Work done by gas is positive

B. Work done by gas is negative

C. Temperature of gas increases continuously

D. Process is isochoric

**Answer: B**

**9.** A bead of mass m is located on a parabolic wire with its axis vertical and vertex at the origin as shown in figure and whose equastion is $x^2 = 4ay$. The wire frame is fixed and the bead is released from the point $y = 4a$ on the wire frame from rest. The tangential acceleration of the bead

when it reaches the position given by $y = a$ is
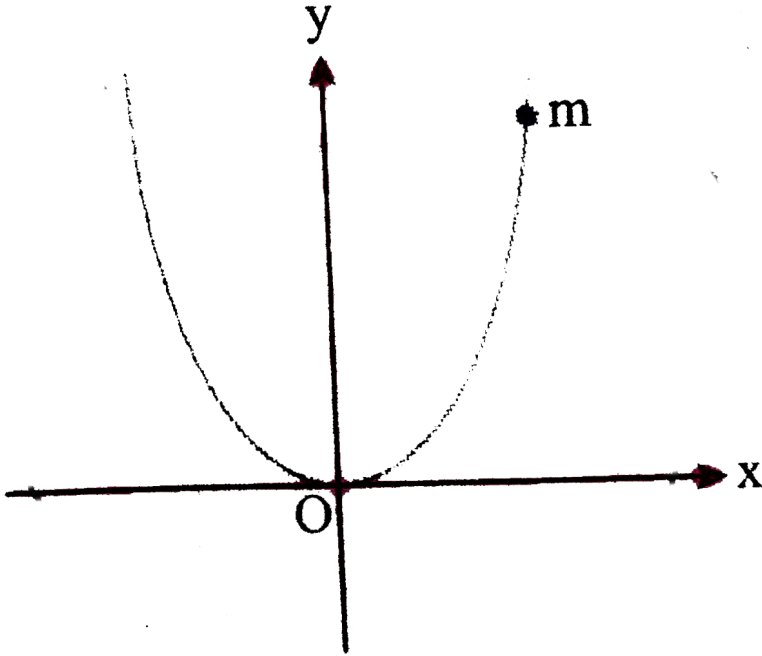


A. $\dfrac{g}{2}$

B. $\dfrac{\sqrt{3g}}{2}$

C. $\dfrac{g}{\sqrt{2}}$

D. $\dfrac{g}{\sqrt{5}}$

**Answer: C**

**10.** A block is dragged on a smooth plane with the help of a rope which moves with a velocity v as shown in figure. The horizontal velocity of the block is :
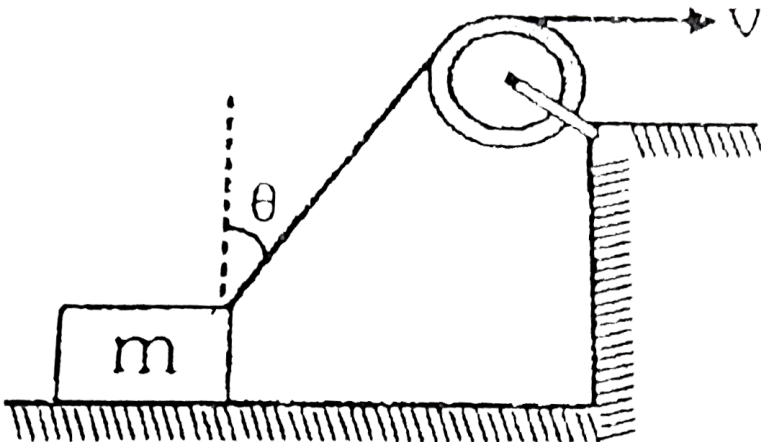


A. $v$

B. $v \sin \theta$

C. $\dfrac{v}{\sin \theta}$

D. $\dfrac{v}{\cos \theta}$

**Answer: C**

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**11.** The time - period of a simple pendulum of length $\sqrt{5}m$ suspended in a car moving with uniform acceleration of $5ms^{-2}$ in a horizontal straight road is $\left(g = 10ms^{-2}\right)$

A. $\dfrac{2\pi}{\sqrt{5}}s$

B. $\dfrac{\pi}{\sqrt{5}}s$

C. $5\pi s$

D. $4\pi s$

**Answer: A**

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**12.** A body P floats in water with half its volume immersed. Another body Q floats in a liquid of density $\frac{3}{4}$th of the density of water with two - third of the volume immersed. The ratio of density of P to that of Q is

A. $1:2$

B. $1:1$

C. $2:3$

D. $3:4$

**Answer: B**

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**13.** Secondary rainbow in the atmosphere is

    A. the result of polarization and dispersion of light

    B. brighter than the primary rainbow

    C. due to the phenomenon of double refraction

    D. formed due to two reflections in the rain drop

**Answer: D**

**14.** A wheel of moment of inertia $2kgm^2$ is rotating about an axis passing through centre and perpendicular to its plane at a speed $60rad/s$. Due to friction, it comes to rest in 5 minutes. The angular momentum of the wheel three minutes before it stops rotating is

A. $24 \text{ kg m}^2/s$

B. $48 \text{ kg m}^2/s$

C. $72 \text{ kg m}^2/s$

D. $96 \text{ kg m}^2/s$

**Answer: C**

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**15.** A common emitter amplifier has a voltage gain of 50, an input impedance of $100\Omega$ and an output impedance of $200$ $\Omega$. The power gain of the amplifier is :-

A. 500

B. 1000

C. 1250

D. 100

**Answer: C**

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**16.** The coefficient of linear expansion of crystal in one direction is $\alpha_1$ and that in every direction perpendicular to it is $\alpha_2$. The coefficient of cubical expansion is

A. $\alpha_1 + \alpha_2$

B. $2\alpha_1 + \alpha_2$

C. $\alpha_1 + 2\alpha_2$

D. None of these

**Answer: C**

**17.** Force acting on a particle is given by $F = \dfrac{A - x}{Bt}$, where x is in metre and t is in seconds. The dimensions of B is -

A. $MLT^{-2}$

B. $M^{-1}T^{-3}$

C. $M^{-1}T$

D. $MT^{-1}$

**Answer: C**

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**18.** If a torch is used in place of monochromatic light in Young's experiment what will happen?

A. Fringe will appear for a moment then, it will disappear

B. Fringes will occur as from monochromatic light

C. Only bright fringes will appear

D. No fringes will appear

**Answer: D**

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**19.** A transverse wave is propagating on a stretched string of mass per unit length $32 gm^{-1}$. The tension on the string is 80 N. The speed of the wave over the string is

A. $\dfrac{5}{2} ms^{-1}$

B. $\sqrt{\dfrac{5}{2}} ms^{-1}$
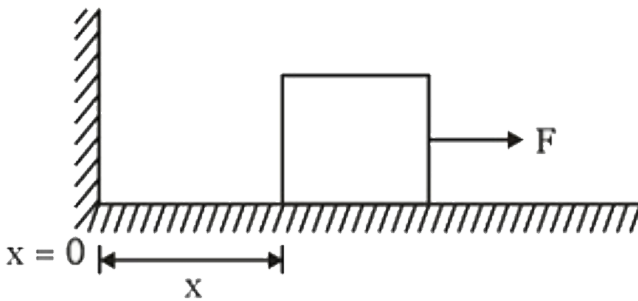
C. $\sqrt{\dfrac{2}{5}} ms^{-1}$

D. $50 ms^{-1}$

**Answer: D**

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**20.** The block of mass 'm' initially at $x = 0$ is acted upon by a horizontal force $F = a - bx$ as shown in the figure. The coefficient of friction between the surfaces of contact is $\mu$. The net work done on the block is zero if the block travels a distance of _____ .



A. $(a - \mu mg) / 2b$

B. $(a - \mu mg) / b$

C. $2(a - \mu mg) / b$

D. $(a - 2\mu mg) / b$

**Answer: C**

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**21.** The mass of a pendulum bob is m = 2kg and the length of the string is l. It is displaced through $90°$ from the vertical and released. What minimum tension (in N) should the string should be able to withstand so that it doesn't break during motion?

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**22.** A professor reads a greeting card received on his 50th birthday with + 2.5 D glasses keeping the card 25 cm away. Ten years later, he reads his farewell letter with the same

glasses but he has to keep the letter 50 cm away. What power of lens should he now use?

**23.** The magnetic induction at the centre of a current carrying circular coil of radius $10cm$ is $5\sqrt{5}$ times the magnetic induction at a point on its axis. The distance of the point from the centre of the coild in $cm$ is

**24.** If the nucleus of $_{13}Al^{27}$ has a nuclear radius of about 3.6 fm, then $_{52}Te^{125}$ would have its radius approximately as

**25.** Monochromatic light of frequency $6.0 \times 10^{14} Hz$ is produced by a laser. The power emitted is $2 \times 10^{-3}$ w. The number of photons emitted, on the average, by the sources per second is