



PHYSICS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 63

Physics

1. Wavelength of first line in Lyman series is λ .

What is wavelength of first line in Balmer series?

A. $\frac{5}{27} \lambda$

B. $\frac{36}{5} \lambda$

C. $\frac{27}{5} \lambda$

D. $\frac{5}{36} \lambda$

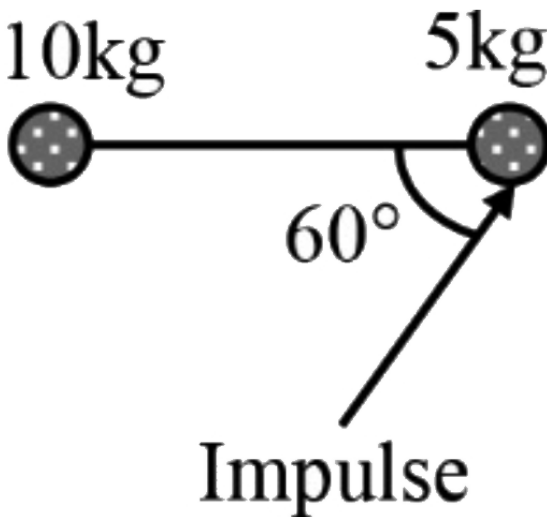
Answer: C



Watch Video Solution

2. Two point masses connected by an ideal string are placed on a smooth horizontal surface as shown in the diagram. A sharp

impulse of 10 kg m s^{-1} is given to the 5 kg mass at an angle of 60° to the line joining the masses. The velocity of the 10 kg mass just after the impulse will be



- A. $\frac{2}{3} \text{ ms}^{-1}$
B. $\frac{1}{3} \text{ ms}^{-1}$

C. $2ms^{-1}$

D. zero

Answer: B

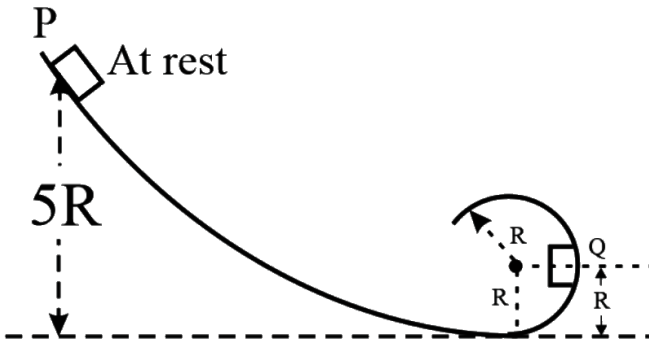


Watch Video Solution

3. A small block of mass m slides along a smooth frictional track as shown in the figure.

If it starts from rest at P, what is the resultant

force acting on it at Q?



A. $\sqrt{70}mg$

B. $\sqrt{60}mg$

C. $\sqrt{75}mg$

D. $\sqrt{65}mg$

Answer: D



4. The length of the potentiometer wire is 600 cm and a current of 40 mA is flowing in it. When a cell of emf 2 V and internal resistance 10Ω is balanced on this potentiometer the balance length is found to be 500 cm. The resistance of potentiometer wire will be

A. 20Ω

B. 40Ω

C. 60Ω

D. 80Ω

Answer: C



Watch Video Solution

5. A transformer is used to light a $100W$ and $110V$ lamp from a $220V$ mains. If the main current is $0.5A$, the Efficiency of the transformer is approximately:

A. 30%

B. 50 %

C. 90 %

D. 10 %

Answer: C



Watch Video Solution

6. A point charge q is placed inside a conducting spherical shell of inner radius $2R$ and outer radius $3R$ at a distance of R from the centre of the shell. The electric potential at

the centre of shell will (potential at infinity is zero).

A. $\frac{1}{4\pi\epsilon_0} \left(\frac{q}{2R} \right)$

B. $\frac{1}{4\pi\epsilon_0} \left(\frac{4q}{3R} \right)$

C. $\frac{1}{4\pi\epsilon_0} \left(\frac{5q}{6R} \right)$

D. $\frac{1}{4\pi\epsilon_0} \left(\frac{5q}{3R} \right)$

Answer: C



Watch Video Solution

7. A body is moving from rest under constant acceleration and let S_1 be the displacement in the first $(p - 1)$ sec and S_2 be the displacement in the first p sec. The displacement in $(p^2 - p + 1)$ sec. will be

A. $S_1 + S_2$

B. $\sqrt{S_1 S_2}$

C. $S_1 - S_2$

D. None of these

Answer: A



Watch Video Solution

8. A body hanging from a massless spring stretches it by 3 cm on earth's surface. At a place 800 km above the earth's surface, the same body will stretch the spring by

(Radius of Earth = 6400 km)

A. $\left(\frac{34}{27}\right)cm$

B. $\left(\frac{64}{27}\right)cm$

C. $\left(\frac{27}{64}\right)cm$

D. $\left(\frac{27}{34}\right)cm$

Answer: B



Watch Video Solution

9. A black body of mass 34.38 g and surface area 19.2cm^2 is at an initial temperature of 400 K . It is allowed to cool inside an evacuated enclosure kept at constant temperature 300 K . The rate of cooling is $0.04^\circ\text{C}/\text{s}$. The specific heat of the body $\text{Jkg}^{-1}\text{K}^{-1}$ is

(Stefan's

constant,

$$\sigma = 5.73 \times 10^{-8} \text{Wm}^{-2} \text{K}^{-4}$$

A. 2800

B. 2100

C. 1400

D. 1200

Answer: C



Watch Video Solution

10. During an adiabatic process, the pressure of a gas is found to be proportional to the cube of its absolute temperature. The ratio C_P / C_V for the gas is

A. $\frac{3}{2}$

B. $\frac{4}{3}$

C. 2

D. $\frac{5}{3}$

Answer: A



Watch Video Solution

11. A circular coil of radius R carries a current i . The magnetic field at its centre is B . The distance from the centre on the axis of the coil where the magnetic field will be $B/8$ is

A. $R\sqrt{2}$

B. $R\sqrt{3}$

C. $2R$

D. $3R$

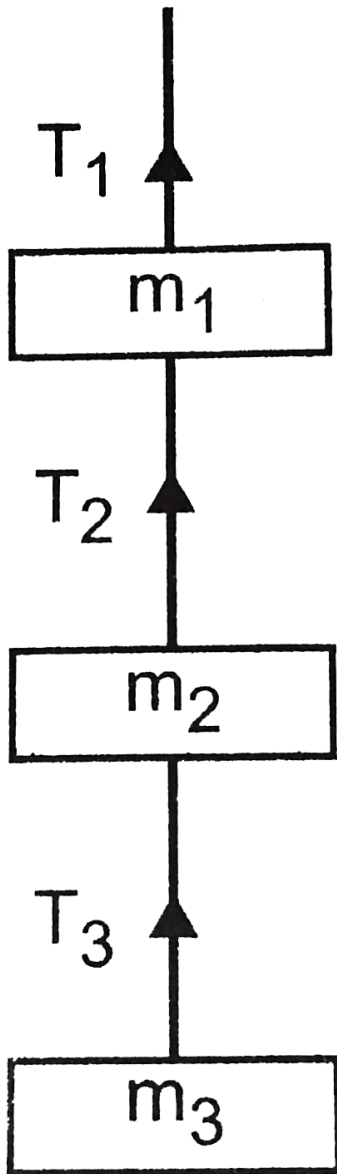
Answer: B



Watch Video Solution

12. The masses m_1 , m_2 and m_3 of the three bodies shown in fig . Are 5 , 2 and 3 kg respectively Calculate the value of tension T_1 , T_2 and T_3 when (i) the whole system is going upward with an acceleration of $2m / s^2$
(ii) the whole system is stationary

$(g = 9.8m / s^2)$.



A. 29.4 N, 98 M, 98 N

B. 98 N, 49 N, 29.4 M

C. 118 N, 59 N, 35.4 N

D. 35.4 N, 118 N, 59 N

Answer: C



Watch Video Solution

13. Calculate the binding energy per nucleon of ${}_{20}^{40}\text{Ca}$. Given that mass of ${}_{20}^{40}\text{Ca}$ nucleus = $39.962589u$, mass of proton = $1.007825u$.

Mass of Neutron = $1.008665u$ and $1u$ is equivalent to $931MeV$.

A. 18.32 MeV

B. 8.55 MeV

C. 9.94 MeV

D. 14.72 MeV

Answer: B



Watch Video Solution

14. A particle is subjected simultaneously to two SHMs, one along the x - axis and the other along the y - axis. The two vibrations are in phase and have unequal amplitudes. The particle will execute

A. Straight line motion

B. Circular motion

C. Elliptic motion

D. Parabolic motion

Answer: A



Watch Video Solution

15. If the work functions of three photosensitive materials are 1 eV, 2 eV and 3 eV respectively, then the ratio of the respective frequencies of light that produce photoelectrons of the maximum kinetic energy of 1 eV from each of them is

A. 1 : 2 : 3

B. 2 : 3 : 4

C. 1 : 1 : 1

D. 3 : 2 : 1

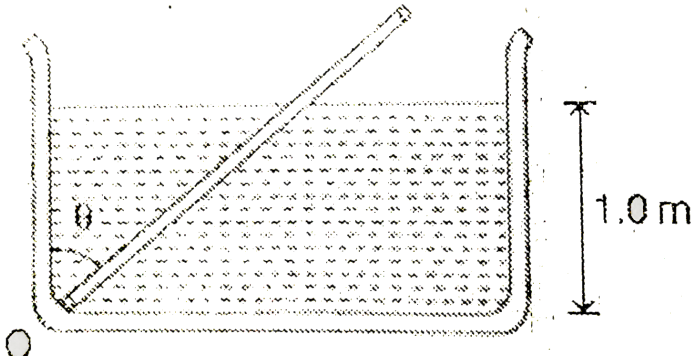
Answer: B



Watch Video Solution

16. A uniform rod of length 2.0 m specific gravity 0.5 and mass 2 kg is hinged at one end to the bottom of a tank of water (specific gravity = 10) filled upto a height of 1.0 m as shown in figure. Taking the case $\theta = - 0^\circ$ the force exerted by the hinges on the rod is

$$(g = 10 \text{ m} / \text{s}^2)$$



- A. 10.2 N, upwards
- B. 4.2 N, downwards
- C. 8.3 N downwards
- D. 6.2 N, upwards

Answer: C



Watch Video Solution

17. A fish looking up through the water sees the outside world contained in a circular horizon. If the refractive index of water is $4/3$ and the fish is 12cm below the surface, the radius of this circle in cm is

A. $36\sqrt{5}$

B. $4\sqrt{5}$

C. $36\sqrt{7}$

D. $36 / \sqrt{7}$

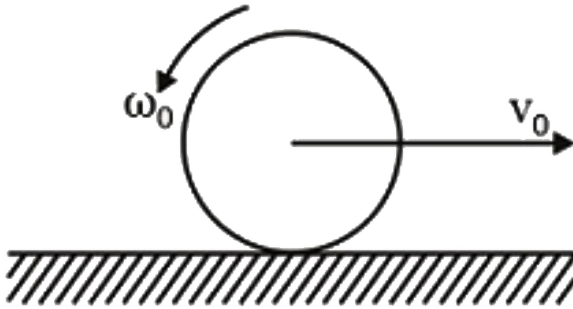
Answer: D



Watch Video Solution

18. A uniform circular disc of radius r placed on a rough horizontal plane has initial velocity v_0 and angular ω_0 as shown. The disc comes to rest after moving some distance in the

direction of motion. Then



A. The friction force acts in the forward direction

B. The point of contact of disc with ground has zero velocity

C. v_0 must be equal to $\frac{r\omega_0}{2}$ in magnitude

D. v_0 must be equal to $2r\omega_0$ in magnitude

Answer: C



Watch Video Solution

19. Heat energy is incident on the surface at the rate of 1000 J/min . If coefficient of absorption is 0.8 and coefficient of reflection is 0.1 then heat energy transmitted by the surface in 5 minute is

A. 100 J

B. 500 J

C. 700 J

D. 900 J

Answer: B



Watch Video Solution

20. Dimensions of ohm are same as that of
(where h is Planck's constant and e is charge)

A. $\frac{h^2}{e^2}$

B. $\frac{h^2}{e}$

C. $\frac{h}{e^2}$

D. $\frac{h}{e}$

Answer: C



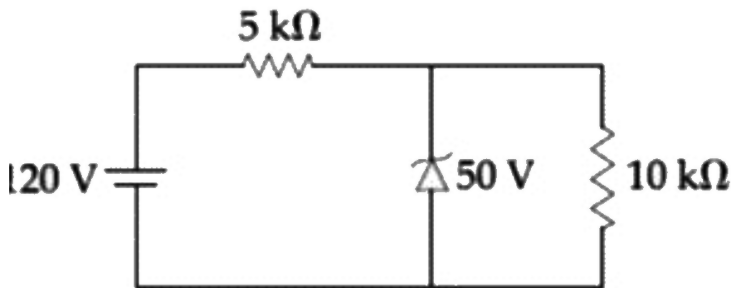
Watch Video Solution

21. A shell bursts on contact with the ground and pieces from it fly in all directions with velocities up to 60m/s . Show that a man 180m away is in danger for $6\sqrt{2}\text{s}$.



Watch Video Solution

22. For the circuit shown below, the current (in mA) through the Zener diode is



[Watch Video Solution](#)

23. When an object is viewed with a light of wavelength 6000\AA under a microscope, its

resolving power is 10^4 . The resolving power of the microscope when the same object is viewed with a light of wavelength 4000\AA , is $n \times 10^3$. The value of n is

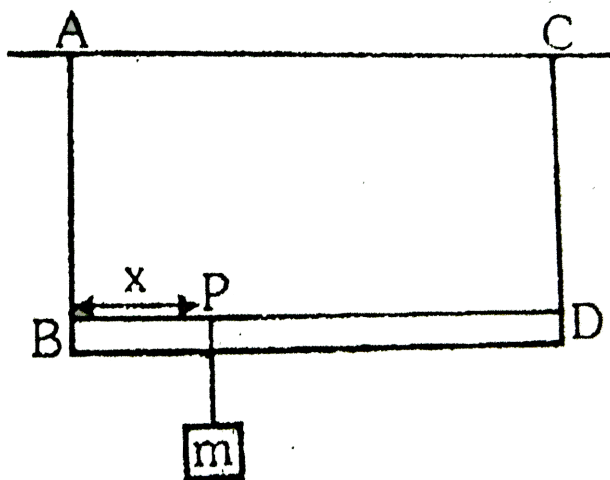


[Watch Video Solution](#)

24. A massless rod BD is suspended by two identical massless strings AB and CD of equal lengths. A block of mass m is suspended at point P such that BP is equal to x , If the fundamental frequency of the left wire is twice

the fundamental frequency of right wire, then

the value of x is :-



[Watch Video Solution](#)

25. The displacement of an object of mass 3 kg

is given by the relation $S = \frac{1}{3}t^2$, where t is

time in seconds. If the work done by the net

force on the object in 2 s is $\frac{p}{q}$ joule, where p and q are smallest integer values, then what is the value of $p + q$?



Watch Video Solution