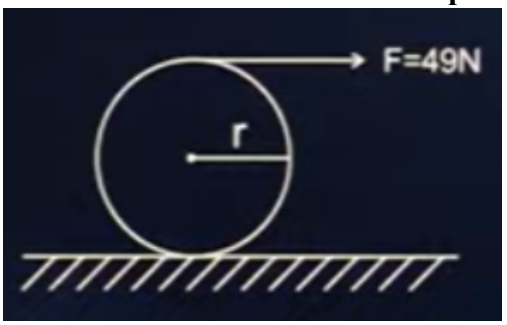
JEE-Main-03-04-2025 (Memory Based)
[MORNING SHIFT]
Physics

Question: An ideal gas with an adiabatic exponent 1.5, initially at 27℃ is compressed adiabatically from 800 cc to 200 cc. The final temperature of the gas is
Options:
(a) 600 K
(b) 300 K
(c) 450 K
(d) 273 K
Answer: (a)

Question: In YDSE, light of intensity of 4I and 9I passes through two slits respectively. Difference of maximum and minimum intensity of interference pattern is
Options:
(a) 5I
(b) 10I
(c) 24I
(d) 26I
Answer: (c)

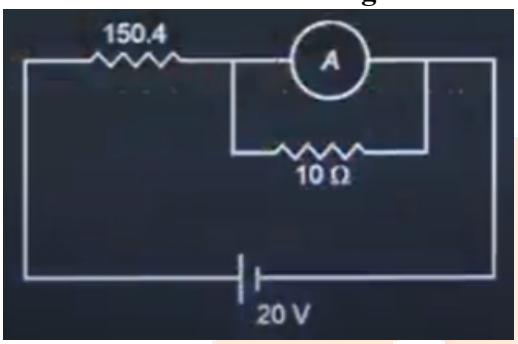
Question: The work function of a metal 3eV. The colour of the visible light that is required to cause emission of photoelectrons is
Options:
(a) Yellow
(b) Blue
(c) Red
(d) Green
Answer (b)

Question: A force of 49 N acts tangentially at the highest point of a sphere (solid of mass 2 kg) kept on a rough horizontal plane. If the sphere rolls without slipping, then the acceleration of the centre of the sphere is



Options:
(a) 0.25 m/s²
(b) 2.5 m/s²
(c) 3.5 m/s²
(d) 0.35 m/s²
Answer: (c)

Question: An ammeter having resistance 240 Ω is connected in the given circuit as shown. Find current through the ammeter.



Options:
(a) 1 mA
(b) 5 mA
(c) 100 mA
(d) 2.5 mA
Answer: (b)

Question: A particle is released from height 's' above the surface of the earth. At certain height it's K.E is 3 times of PE. The height from the surface of the earth and the speed of the particle at the instant are respectively.
Options:
(a) $\frac{s}{4}, \sqrt{\frac{3gs}{2}}$
(b) $\frac{s}{2}, \sqrt{\frac{3gs}{2}}$
(c) $\frac{s}{2}, \frac{3gs}{2}$
(d) $\frac{s}{4}, \frac{3gs}{2}$
Answer: (a)

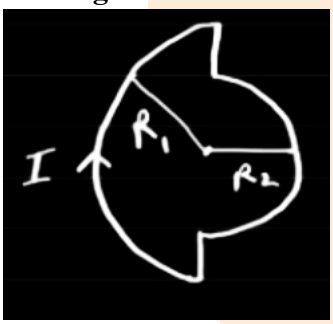
Question: The Electrostatic potential on the surface of uniformly charged spherical shell of radius R = 10 cm is 120 V. The potential at the centre of shell, at a distance 5 cm from centre and a distance 15 cm from the centre of the shells are
Options:
(a) 40 V, 40 V, 80 V
(b) 120 V, 120 V, 80 V
(c) 0 V, 120 V, 40 V
(d) 0 V, 0 V, 80 V

Answer: (b)

Question: Power of point source is 450 watt. Radiation pressure on a perfectly Reflecting surface at a distance of 2 m is …… .
Options:
(a) 1.5×10^{-8}
(b) 3×10^{-8}
(c) 0
(d) 6×10^{-8}
Answer: (d)

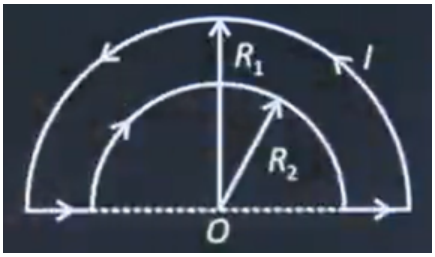
Question: A thin uniform wire of length 25 m and area of cross-section 5 mm² has resistivity 2×10^{-6} Ω-m. If the wire is bent to form a circle, the resistance across diametrically opposite points is
Options:
(a) 5 Ω
(b) 2.5 Ω
(c) 10 Ω
(d) 12.5 Ω
Answer: (b)

Question: There is a setup of conducting wire having current I as shown in figure. Find the magnetic field at the centre.



Options:
(a) $\mu_0 I\left[\frac{1}{R_1}+\frac{1}{R_2}\right]$
(b) $\frac{\mu_0}{4} I\left[\frac{1}{R_1}+\frac{1}{R_2}\right]$
(c) $\frac{\mu_0 I}{4}\left[\frac{1}{R_1}-\frac{1}{R_2}\right]$
(d) $\frac{\mu_0 I}{4\pi}\left[\frac{R_1 R_2}{R_1+R_2}\right]$
Answer: (b)

Question: A current carrying wire is bent as shown in the figure. Find magnetic field at centre O of the semi-circles. (Take $R_1 = 4\pi$ and $R_2 = 6\pi$)



Options:

(a) $8.3l \times 10^{-6}$ T

(b) $8.3l \times 10^{-9}$T

(c) $4\pi l \times 10^{-7}$ T

(d) $6l \times 10^{-8}$ T

Answer: (b)

Question: A biconvex lens is having the radius of curvature of 10 cm and 15 cm. If focal length of the lens is 12 cm find refractive index of material of the lens.

Options:

(a) 3/2

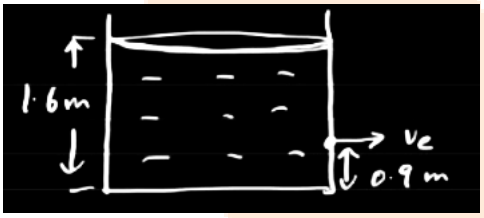
(b) 4/3

(c) 2

(d) √3

Answer: (a)

Question: These is a contains of area of cross section 0.5 m² which is filled upto height 1.6 m with water. It has piston of mass 20 kg placed above water. If there is an orifice at a height 0.9 m above the ground level then. Find the velocity of efflux



Options:

(a) 7 m/s

(b) 3.5 m/s

(c) 2.5 m/s

(d) 3.85 m/s

Answer: (d)

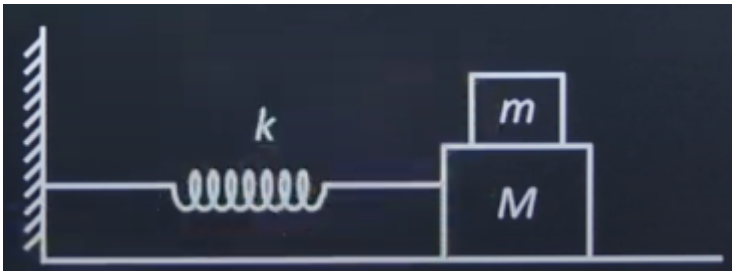
Question: The figure below shows an oscillating system of two blocks and a spring. The horizontal surface is smooth and the contact between the blocks is rough with coefficient of static friction μ.

Considering that the blocks of mass m is always stationary relative to M, choose the correct option regarding the statement below:

(A) Maximum frictional force between blocks is μ mg.

(B) Time period of oscillation is $2\pi\sqrt{\frac{m+M}{k}}$

(C) Friction between the blocks at any instant is μ(m + M)g



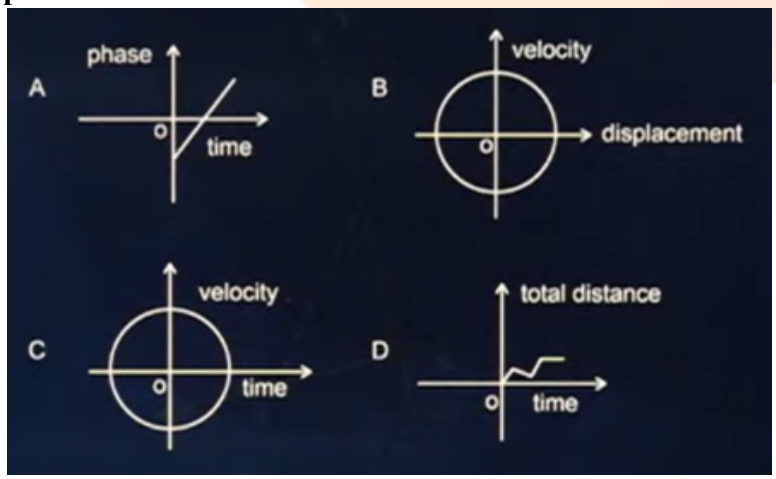
Options:
(a) A correct
(b) B correct
(c) A, B, C correct
(d) C correct
Answer: (b)

Question: Choose the correct option.

a.	**Gravitational potential**	**(i)**	**$M^{-1}L^{3}K^{-2}$**
b.	**Gravitational constant**	**(ii)**	**$ML^{2}T^{-2}$**
c.	**Acceleration due to gravity**	**(iii)**	**$M^{0}L^{2}T^{-2}$**
d.	**Potential energy**	**(iv)**	**$M^{0}LT^{-2}$**

Options:
(a) a(iii), b(ii), c(iv), d(i)
(b) a(iii), b(i), c(iv), d(ii)
(c) a(ii), b(i), c(iv), d(iii)
(d) a(ii), b(iv), c(i), d(iii)
Answer: (b)

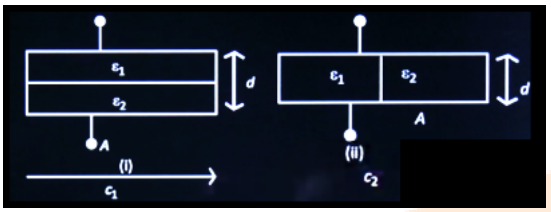
Question: Which of the following curves possibly represent one dimensional motion of a particle?



Options:
(a) A and B

(b) A, B, D
(c) A, B, C
(d) A, C, D
Answer: (b)

Question: Capacitors with dielectric are shown in figure (symmetric situation). Find $\frac{c_1}{c_2}$



Options:

(a) $\frac{4\varepsilon_1\varepsilon_2}{(\varepsilon_1+\varepsilon_2)^2}$

(b) $\frac{4\varepsilon_1\varepsilon_2}{\varepsilon_1+\varepsilon_2}$

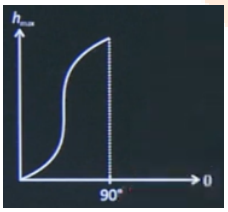
(c) $\frac{2\varepsilon_1\varepsilon_2}{(\varepsilon_1+\varepsilon_2)^2}$

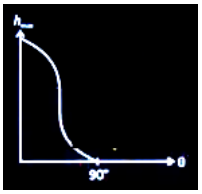
(d) $\frac{(\varepsilon_1\varepsilon_2)^2}{(\varepsilon_1+\varepsilon_2)^2}$

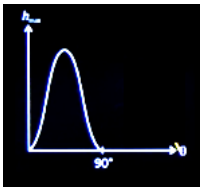
Answer: (a)

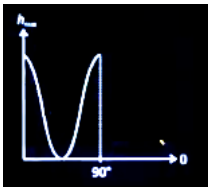
Question: From a horizontal surface a particle is projected with a speed u. Which of the following correctly respect the variation of maximum height above the surface attained by the particle as the angle of projection is varied?

Options:

(a) 

(b) 

(c) 

(d) 

Answer: (a)

Question: Choose the correct option.

	Column I		Column II
a.	**Hydrogen nuclei**	**(i)**	**Fusion with positive Q value**
b.	**Uranium nucleus**	**(ii)**	**Fusion with negative Q value**
c.	**Fusion of hydrogen & helium nucleus**	**(iii)**	**Chemical reaction**
d.	**$2H_2 + O_2 \rightarrow 2H_2O$**	**(iv)**	**Fission**

Options:

(a) a-ii, b-iii, c-i, d-iii
(b) a-i, b-iv, c-i, d-iii
(c) a-ii, b-iv, c-ii, d-iii
(d) a-iii, b-iv, c-ii, d-i

Answer: (b)