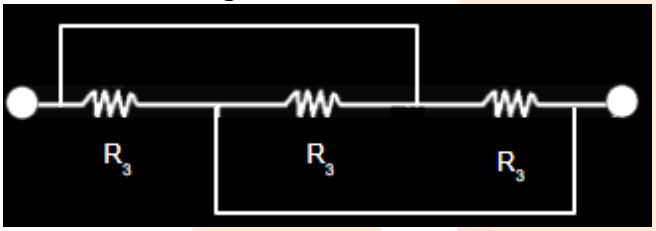
JEE-Main-28-01-2025 (Memory Based)
[MORNING SHIFT]

Physics

Question: The equivalent resistance across A and B is



Options:
(a) R/3
(b) R/2
(c) R/9
(d) R
Answer: (c)

Question: A uniform wire of linear charge density λ is placed along y-axis. The locus of equipotential
Options:
(a) $x^2+y^2+z^2$ = constant
(b) x^2+z^2 = constant
(c) xyz = constant
(d) xy + yz + zx = constant
Answer: (b)

Question: Three carnot engine operating at different temperature ranging from
273 K → 473 K, $373 \overset{K}{\rightarrow} 473k,$ **273 K → 373 K, Find % efficiency nearly**
Options:
(a) 42, 21, 26
(b) 52 , 24 , 28
(c) 22, 21 , 26
(d) 50, 21, 26
Answer: (a)

Question: Which of the following reactions is correct? (Where symbols have their usual meanings)
Options:
(a) n → p+e^- +v

(b) $n \rightarrow p+e^{+}+v$

(c) $n \rightarrow p + e^{+} + \overline{v}$

(d) $n \rightarrow p + e^{-} + \overline{v}$

Answer: (d)

Question: Two disc having equal mass, radius of one is twice the other find the ratio of I_1/I_2 ($r_2 = r_1 \times 2$)

Options:

(a) 1/4

(b) 4/1

(c) 2/1

(d) 1/2

Answer: (a)

Question: An ice water mixture is present at 273 Kelvin at the initial pressure equal to atmospheric pressure if the pressure is doubled keeping the temperature constant then

Options:

(a) More ice will melt

(b) More ice water will convert to ice

(c) Water will vapourize completely

(d) Water will completely convert to ice

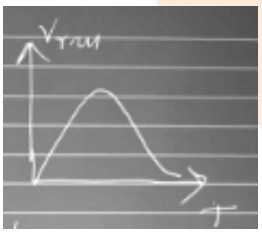
Answer: (a)

Question: The graph of root mean square velocity versus temperature is ?

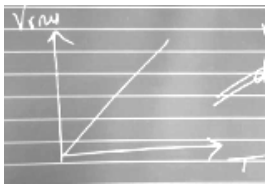
Options:

(a)

(b)



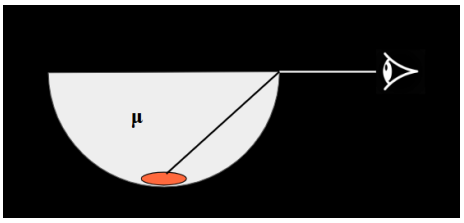
(c)



(d)

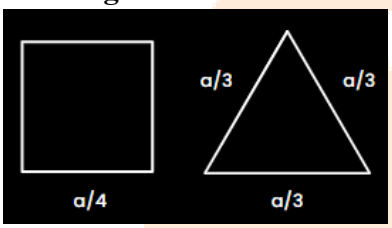
Answer: (d)

Question: A coin is placed at the bottom of a hemispherical container filled with a liquid of refractive index u. Find the least refractive index if the coin is visible to an observer at E.



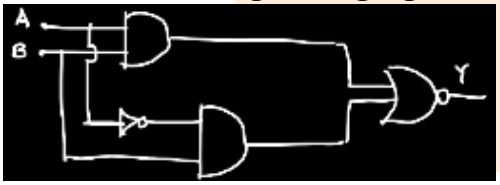
Options:
(a) √3
(b) √2
(c) √3/2
(d) 2√3
Answer: (b)

Question: In the given figure, the square and the triangle have the same resistance per unit length. Find the ratio of their resistances about adjacent corners.



Options:
(a) 32/27
(b) 27/32
(c) 8/9
(d) 9/8
Answer: (b)

Question: For the given logic gates combination correct truth table will be



Options:
(a)

A	B	Y
0 0 1 1	0 1 0 1	0 0 1 1

(b)

A	B	Y
0 0 1 1	0 1 0 1	0 1 0 1

(c)

A	B	Y
0 0 1 1	0 1 0 1	0 1 1 1

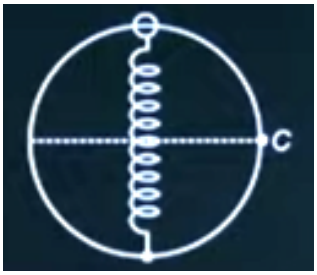
(d)

A	B	Y
0 0 1 1	0 1 0 1	1 0 1 0

Answer: (d)

Question: Assertion : Work done by central force is independent of path.
Reason : Potential energy is associated with every force.
Options:
(a) Both Assertion and Reason are correct
(b) Assertion is correct, Reason is incorrect
(c) Assertion is incorrect, Reason is correct
(d) Both Assertion and Reason are incorrect
Answer: (d)

Question: There is a smooth ring of radius R in the vertical plane. A spring of natural length R and elastic constant K is vertical across along a diameter. The free end is connected to bead of mass m and when slightly disturbed it reaches point C with speed where V is



Options:

(a) $\sqrt{\frac{KR^2\left(\sqrt{2}-1\right)+2mgR}{m}}$

(b) $\sqrt{\frac{2KR^2\left(\sqrt{2}-1\right)+2mgR}{m}}$

(c) $\sqrt{\frac{2KR^2\left(\sqrt{2}-1\right)+mgR}{m}}$

(d) $\sqrt{\frac{KR^2\left(\sqrt{2}-1\right)+mgR}{m}}$

Answer: (b)

Question: A proton moving at kinetic energy E has the same kinetic energy as that of a photon. The ratio of de-Broglie wavelength of proton to photon is

Options:

(a) $\frac{1}{C}\sqrt{\frac{2E}{m}}$

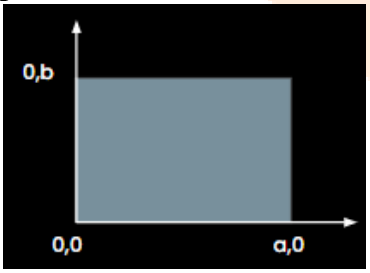
(b) $\frac{1}{C}\sqrt{\frac{E}{2m}}$

(c) $\frac{2}{C}\sqrt{\frac{E}{m}}$

(d) $\frac{2}{C}\sqrt{\frac{2E}{m}}$

Answer: (b)

Question: Surface mass density varies as $\sigma = \frac{\sigma_0 x}{ab}$ for the given plane sheet. Find the position of centre of mass for the distribution given



Options:

(a) 2a/3, 2b/3

(b) 2a/3, b/2

(c) a/3, b/2

(d) a/2, b/2

Answer: (b)

Question: Identify the correct statement/s from the following list and select the appropriate option.
I) The coefficient of viscosity decreases as the temperature increases.
II) Terminal velocity of a spherical body falling through a viscous fluid depends on it radius r, it's density and acceleration due to gravity.
III) Terminal velocity of a spherical body falling through a viscous fluid depends only on density of body and density of fluid.
IV) The coefficient of viscosity is independent of temperature.
V) Viscous force acting on a spherical body is directly proportional to speed of body
Options:
(a) I, II , V
(b) III , V
(c) I , II , V
(d) III , VI , V
Answer: (c)

Question: When light of 600 nm is used, the 10th bright fringe is 10 mm from central bright. Find the distance from central max if light of 660 nm is used.
Options:
(a) 10 mm
(b) 11 mm
(c) 12 mm
(d) 14 mm
Answer: (b)

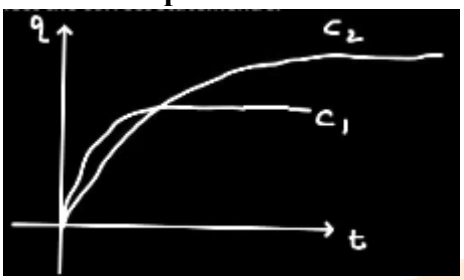
Question: Dispersion without deviation is produced by two thin (small angled) prisms which are combined together. One prism has angle 4° and refractive index 1.56. If the other prism has refractive index 1.7, what is it's angle ?
Options:
(a) 3.2°
(b) 2.2°
(c) 5.5°
(d) 8°
Answer: (a)

Question: 3 infinite wires each having linear charge density λ are kept, one each at x, y and z axis respectively. Then the locus of equipotential surface will be
Options:
(a) $xyz = \text{constant}$
(b) $xy + yz + zx = \text{constant}$
(c) $(x+y)(y+z)(z+x) = \text{constant}$
(d) $(x^2+y^2)(y^2+z^2)(z^2+x^2) = \text{constant}$
Answer: (d)

Question: If the area of 2.5 mm x 5 mm sheet is calculated using a screw gauge of pitch 0.75 mm and 15 division on circular scale, then the error in the calculation of area is x/100 . Find x after rounding off.
Options:
(a) 38
(b) 48

(c) 58
(d) 28
Answer: (a)

Question: If two capacitors C_1 and C_2 are in parallel combination. Variation of charge stored on capacitor with time is show in the graph. Select the correct statement/s.



(1) $C_1 > C_2$
(1) $C_1 < C_2$
(3) $U_1 > U_2$
(4) $U_1 < U_2$
Options:
(a) 1 & 3
(b) 1 & 4
(c) 2 & 3
(d) 2 & 4
Answer: (d)