

JEE-Main-08-04-2024 (Memory Based)
[MORNING SHIFT]

Physics

Question: In a LCR circuit at resonance, what will happen to current if resistance is halved?

Options:

- (a) Current will be Halved
- (b) Current will be doubled
- (c) Current will be tripled
- (d) Current will be quadrupled

Answer: (b)

Question: Identify the expression for Bernoulli's Equation

Options:

- (a) $P + \rho gh + \frac{1}{2} \rho v^2 = \text{const}$
- (b) $P^2 + \rho gh + \frac{1}{2} \rho v^2 = \text{const}$
- (c) $P + \rho gh + \rho v^2 = \text{const}$
- (d) $P + \frac{1}{2} \rho gh + \rho v^2 = \text{const}$

Answer: (a)

Question: A player caught a ball of mass 150 gm, travelling at 20 m/s. If the catching process was completed in 0.1 sec, find the force exerted by the ball on the player's hands.

Options:

- (a) 30 N
- (b) 60 N
- (c) 70 N
- (d) 90 N

Answer: (a)

Question: In a diffraction setup, if the slit width is $b = 0.03$ cm and wavelength is 600 nm then the angular position of 2nd order minimum is θ . Find the value of $\sin \theta$

Options:

- (a) 0.004
- (b) 0.001
- (c) 0.002
- (d) 0.003

Answer: (a)

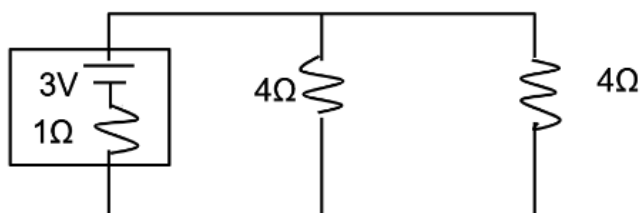
Question: Which of the following statements is INCORRECT regarding the paramagnetic substance ?

Options:

- (a) They have small but positive susceptibility
- (b) They are slightly attracted by magnetic field
- (c) Their susceptibility increases with rise in temperature
- (d) None of the above

Answer: (c)

Question: Find Potential difference across terminals of the cell



Options:

- (a) 1 V
- (b) 2 V
- (c) 3 V
- (d) 4 V

Answer: (b)

Question: Determine the ratio of specific heat at constant volume for monoatomic to Diatomic gas

Options:

- (a) $5/3$
- (b) $3/5$
- (c) $5/7$
- (d) $7/5$

Answer: (b)

Question: The resistance of conductor is 10Ω at 0°C and 10.2Ω at 100°C what Temp the resistance will be 10.95Ω

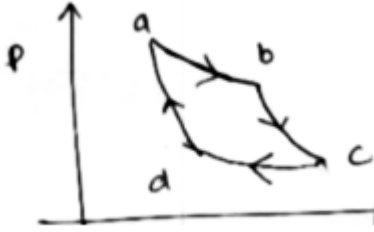
Options:

- (a) 234 K
- (b) 500 K
- (c) 748 K
- (d) 900 K

Answer: (c)

Question:

Options: The PV curve shown in the diagram consists of two isothermal and adiabatic curves. Then:



- (a) $\frac{V_a}{V_d} = \frac{V_b}{V_c}$
 (b) $\frac{V_a}{V_d} = \left(\frac{V_b}{V_c}\right)^{-1}$
 (c) $\frac{V_a}{V_d} = \left(\frac{V_c}{V_b}\right)^2$
 (d) $\frac{V_a}{V_d} = \frac{V_c}{V_b}$

Answer: (a)

Question: In a series LCR Circuit, the value of resistance as well as $(X_L - X_C)$ is halved, then the new current amplitude (I_2) will satisfy: (I_1 is old current amplitude)

Options:

- (a) $I_2 = 2I_1$
 (b) $I_2 = 0$
 (c) $I_2 = \frac{I_1}{2}$
 (d) $I_2 = I_1$

Answer: (a)

Question: Proton and electron have same kinetic energy. Find ratio of their de-broglie wavelength.

Given $m_p = 1836 m_e$

Options:

- (a) $1 = \sqrt{1836}$
 (b) $\sqrt{1836} = 1$
 (c) $1 = 1836$
 (d) $1 : 1$

Answer: (a)

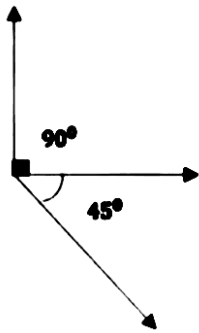
Question: Binding energy is 18×10^8 Find Mass in Microgram

Options:

- (a) 10
 (b) 20
 (c) 30
 (d) 40

Answer: (b)

Question: If the resultant of the vectors shown in $A\sqrt{x}$, find x.



Answer: (3)

Question: In a clock, second hand and minute hand are of 75 cm and 60 cm respectively. After 30 minutes, ratio of distance travelled by the tip of second hand to that of minute hand is x. Find x.

Options:

Answer: (75)

Question: Two planets are revolving around the sun of mass M_a and M_b . Ratio of angular momentum is 1:3. Find time period ratio in terms of masses.

Options:

(a) $m_b^3/27m_a^3$

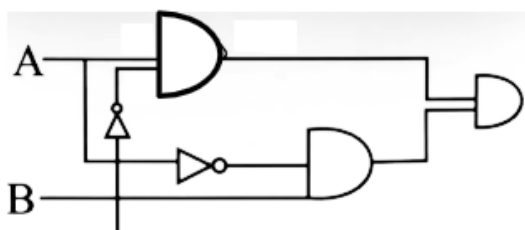
(b) $m_a^3/27m_b^3$

(c) $m_b^3/9m_a^3$

(d) $m_a^3/9m_b^3$

Answer: (a)

Question: What would be the Output of the given logic gate?



Options:

(a) $A \cdot B + \underline{A}$

(b) $\underline{A} \cdot B + A$

(c) $\underline{A} \cdot B + A + \underline{B}$

(d) 0

Answer: (d)

Question: The ratio of frequency of 7th overtone of closed organ pipe and open organ pipe of same length is ___.

Options:

(a) 15/6

- (b) 16/5
- (c) 1/1
- (d) 7/6

Answer: (a)

Question: Three masses $M_A = 400$ gram, $M_B = 1.2$ KG, $M_C = 1.6$ KG have same. Kinetic Energy. Determine ratio of their linear momenta.

Options:

- (a) 1: $\sqrt{5}$: 2
- (b) 1: $\sqrt{3}$: 5
- (c) 1: $\sqrt{3}$: 2
- (d) 1: $\sqrt{3}$: 3

Answer: (c)

Question: If an area 4m^2 lies along $2\sqrt{6}\hat{i} + 4\sqrt{6}\hat{j} + 2\sqrt{6}\hat{k}$

Find flux is $\vec{E} = 4\hat{i} + 8\hat{j} + 4\hat{k}$

Options:

- (a) 3 Wb
- (b) 4 Wb
- (c) 5 Wb
- (d) 6 Wb

Answer: (d)

Question: Two conducting sphere of radii a and b are connected by wire. What is the ratio of their charges respectively?

Options:

- (a) a/b
- (b) b/a
- (c) ab
- (d) None of these

Answer: (a)

Question: On a perfectly absorbing surface of area A , a light rays of intensity $I = 360$ W/cm² falls normally if the force exerted is F , then find the area (A in m²)

Options:

- (a) $F/12 \times 10^5$
- (b) $F \times 10^5$
- (c) $12F \times 10^5$
- (d) None

Answer: (a)