# JEE-Main-23-01-2025 (Memory Based)
# [EVENING SHIFT]

## Physics

**Question:** Two charged particles have values $14\ \mu C$ & $-14\ \mu C$ are at positions ( 7, 0, 0) m & ( -7, 0 , 0) m. Find potential energy between them .
**Options:**
(a) 0.126 J
(b) -0.126 J
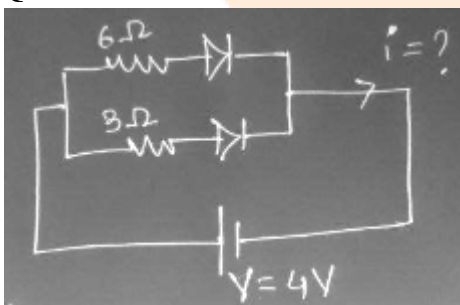(c) 0.252 J
(d) -0.252 J
**Answer:** (b)

**Question:** If 40 m takes 27 days to revolve around earth, then the time taken by an object to revolve around earth which is at a distance of 1/9 times the distance of the moon from Earth is
**Options:**
(a) 1 day
(b) 9 days
(c) 3 days
(d) 27 days
**Answer:** (a)

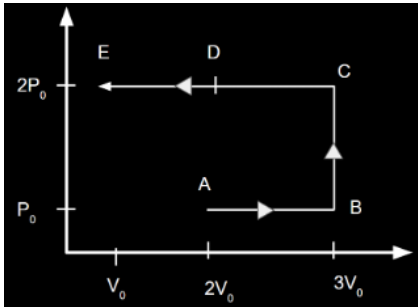**Question:** Diodes are ideal. Find current through the battery



**Options:**
(a) 1 A
(b) 2 A
(c) 3 A
(d) 4 A
**Answer:** (b)

**Question:** Find total work done from A to E

**Options:**
(a) $-3P_0V_0$
(b) $3P_0V_0$
(c) $2P_0V_0$
(d) $5P_0V_0$
**Answer: (a)**

**Question: A disc of mass M and Radius R is rotating about its axis. If the angle rotated about it as a function of time 't' is $\theta = at^2 + bt + c$ where a, b and c are constants then find the power derived to the disc as a function of time.**
**Options:**
(a) $aMR^2 (2at + b)$
(b) $aMR^2$
(c) $2 a^2MR^2 t$
(d) $aMR^2 b$
**Answer: (a)**

**Question: A convex mirror of focal length 'f' is dipped in a liquid of refraction index $\mu$. The new focal length is**
**Options:**
(a) $2f$
(b) $\mu f$
(c) $f$
(d) $f/\mu$
**Answer: (c)**

**Question: A projectile is thrown at an angle of 60°. It has kinetic energy K. What will be its kinetic energy at the top most position ?**
**Options:**
(a) $2K$
(b) $4K$
(c) $K/2$
(d) $K/4$
**Answer: (d)**

**Question: The work function of a metal is 2.14 eV. Find the wavelength of the incident light if the stopping potential of 0.6 V.**
**Options:**
(a) 326 nm
(b) 454 nm
(c) 524 nm

**(d) 232 nm**
**Answer: (b)**

**Question: Statement 1: Graph of frequency f of X ray and atomic number Z of heavy nucleus is straight line, in**
**X ray emission.**
**Statement 2: Graph of square root of frequency √f of X ray and atomic number Z of heavy nucleus**
**is straight line, in X ray emission.**
**Options:**
**(a) Statement 1 is correct and statement 2 is correct**
**(b) Statement 1 is incorrect and statement 2 is correct**
**(c) Statement 1 is correct and statement 2 is incorrect**
**(d) Statement 1 is incorrect and statement 2 is incorrect**
**Answer: (b)**

**Question: In an LCR circuit, inductor is 100 mH, capacitor is 25 nF, resistor is 10 kΩ .**
**Find angular freqn at which current becomes maximum**
**Options:**
**(a) 2 x 10⁴ rad/s**
**(b) 2 x 10³ rad/s**
**(c) 2 x 10² rad/s**
**(d) 2 x 10⁵ rad/s**
**Answer: (a)**

**Question: A prism of refractive index of $\mu = \sqrt{2}$ is placed such that angle prism is equal to minimum angle of deviation. Find angle of prism .**
**Options:**
**(a) 60°**
**(b) 30°**
**(c) 45°**
**(d) 15°**
**Answer: (a)**

**Question: Find the pressure differences of air bubble of radius 2 cm formed 20 cm below an open water surface and atmospheric pressure**
**(given surface tension of water = 70 x 10⁻³ N/m)**
**Options:**
**(a) 0.3 x 10⁵ N/m²**
**(b) 0.022 x 10⁵ N/m²**
**(c) 2.03 x 10³ N/m²**
**(d) 1.03 x 10⁵ N/m²**
**Answer: (b)**

**Question: A capacitor of 0.25 $\mu$F connected across a variable voltage has a displacement current of 2.5 mA at a certain moment. Find the rate of change of voltage across capacitor at this moment**
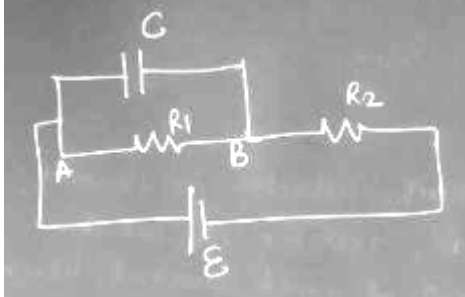**Options:**
**(a) 10000 Volt/sec**
**(b) 1000 Volt/sec**

(c) 100 Volt/sec
(d) 10 Volt/sec
Answer: (a)

Question:



Find q on capacitor in steady state .
Options:
(a) cε
(b) cε/2
(c) 2cε
(d) cε/4
Answer: (b)

Question: Statement 1 :For  30 < A <  170, the binding energy per nucleon is almost constant
Statement 2 : Nuclear force is long range force
Options:
(a) Both the Statements are correct
(b) Only Statement 2 is correct
(c) Only Statement 1  is correct
(d) Both the statements are wrong
Answer: (c)

Question: There is a horizontal pipe of variable cross-section having fluid of density flowing through it. At cross section A & B the velocities are $V_A$ & $V_B$ and pressure $P_A$ & $P_B$ . Find the correct relation between velocities.
Options:

(a) $V_A - V_B = \dfrac{\rho}{2\left(P_B^2 - P_A^2\right)}$

(b) $V_A - V_B = \dfrac{2(P_A - P_B)}{\rho}$

(c) $V_A^2 - V_B^2 = \dfrac{2(P_B - P_A)}{\rho}$

(d) $V_A^2 - V_B^2 = \dfrac{2(P_A - P_B)}{\rho}$

Answer: (c)

Question: In an EM Wave of Frequency 20 Mhz Electric Field is 9.3 V/m. What is the Value of Magnetic FIeld at that instant?

**Options:**
**(a) $3.1 \times 10^8$ T**
**(b) $3.1 \times 10^{-8}$ T**
**(c) $0.13 \times 10^8$ T**
**(d) $0.13 \times 10^{-8}$ T**
**Answer: (b)**

**Question: If in a rod tension of 7 N produces extension $x_1$ & tension of 5 N produces extension $x_2$ then find tension that produces extension $7x_1 - 5x_2$**
**Options:**
**(a) 50 N**
**(b) 24 N**
**(c) 36 N**
**(d) 128 N**
**Answer: (b)**