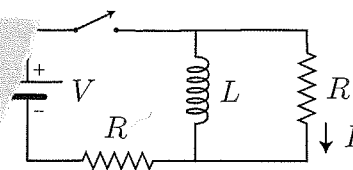
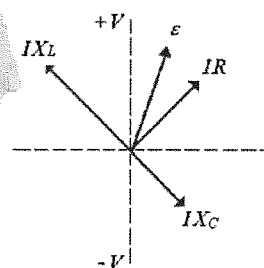


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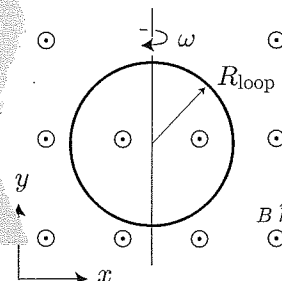
**Part I. Lecture Multiple Choice (90 points total)**



- A.  $I = V/R$   
B.  $I = V/2R$   
C.  $I = 0$   
D.  $I = -V/2R$   
E.  $I = -V/R$

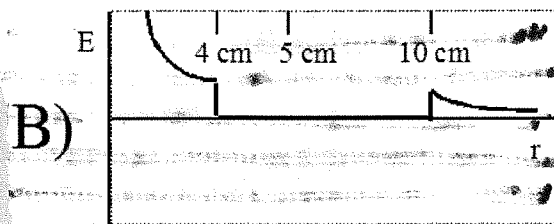


- A.  $V_L = 0$
- B.  $V_L = V_{Lmax}/2$
- C.  $V_L = V_{Lmax}$



- A.  $I = 0 \text{ A}$   
B.  $I = 2.2 \times 10^{-1} \text{ A}$   
C.  $I = 3.1 \times 10^{-3} \text{ A}$   
D.  $I = 5.6 \times 10^{-3} \text{ A}$   
E.  $I = 2.2 \times 10^{-3} \text{ A}$

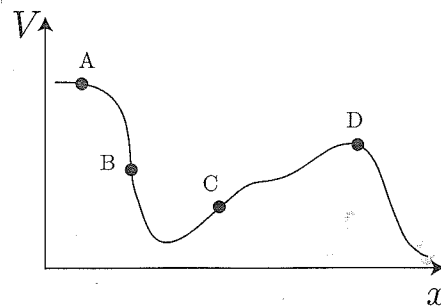
Name \_\_\_\_\_ Student ID Number \_\_\_\_\_  
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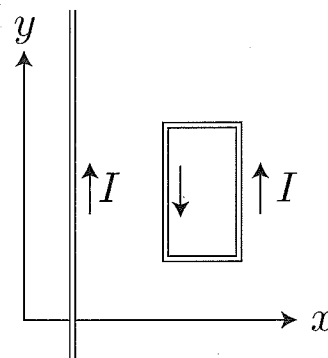
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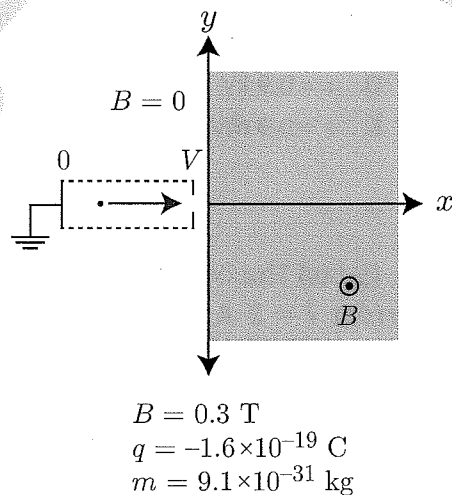
- A. Point A.  
 B. Point B.  
☒ C. Point C.  
 D. Point D.



- ☒ A.  $F_x > 0$   
 B.  $F_x = 0$   
 C.  $F_x < 0$



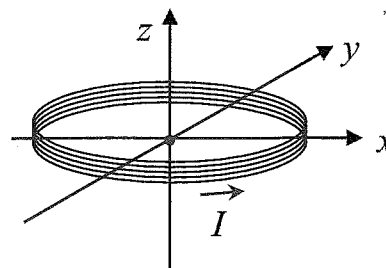
- A.  $t = 1.2 \times 10^{-15} \text{ s}$   
 B.  $t = 7.5 \times 10^{-12} \text{ s}$   
☒ C.  $t = 6.0 \times 10^{-11} \text{ s}$   
 D.  $t = 8.3 \times 10^{-8} \text{ s}$   
 E. Not enough information.



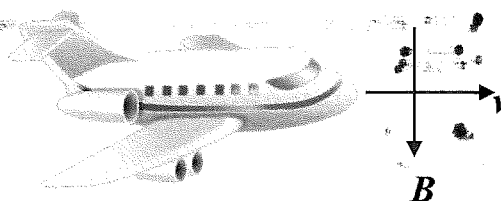
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- A.  $\mu = 0.094 \text{ A}\cdot\text{m}^2$ , in the  $-z$  direction  
 B.  $\mu = 0.094 \text{ A}\cdot\text{m}^2$ , in the  $+z$  direction  
 C.  $\mu = 9.42 \text{ A}\cdot\text{m}^2$ , in the  $-z$  direction  
 D.  $\mu = 9.42 \text{ A}\cdot\text{m}^2$ , in the  $+z$  direction  
 E.  $\mu = 94.2 \text{ A}\cdot\text{m}^2$ , in the  $+z$  direction

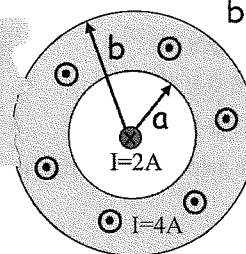


te  
ing  
magnetic



- A.  $\varepsilon = 0.0 \text{ V}$   
 B.  $\varepsilon = 0.45 \text{ V}$   
 C.  $\varepsilon = 0.90 \text{ V}$   
 D.  $\varepsilon = 0.9 \text{ kV}$   
 E.  $\varepsilon = 0.9 \text{ mV}$

$a = 0.12 \text{ m}$   
 $b = 0.26 \text{ m}$

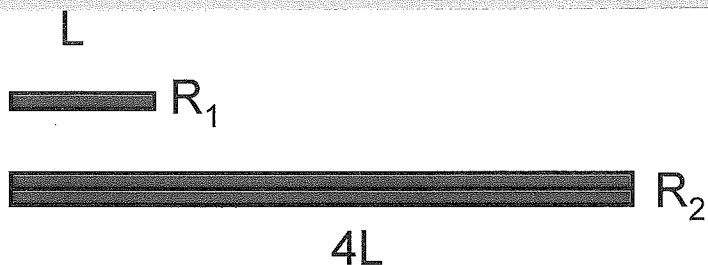


current density is constant throughout each conductor.)

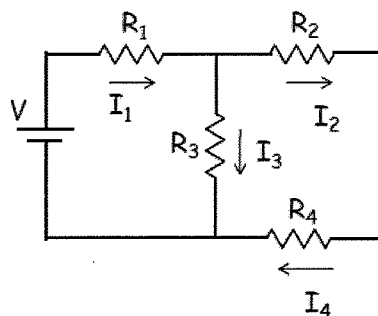
- A. 0.19 m  
 B. 0.20 m  
 C. 0.21 m  
 D. 0.25 m  
 E. The magnetic field is not zero anywhere inside the hollow wire.

and  $R_2$ :

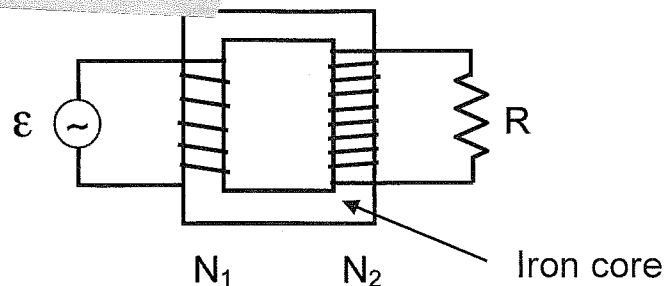
- A.  $R_2 = R_1$
- B.  $R_2 = 2R_1$
- C.  $R_2 = 4R_1$
- D.  $R_2 = R_1/4$
- E.  $R_2 = R_1/2$



- A. 1.64 V
- B. 2.64 V
- C. 3.64 V
- D. 4.36 V
- E. 5.36 V

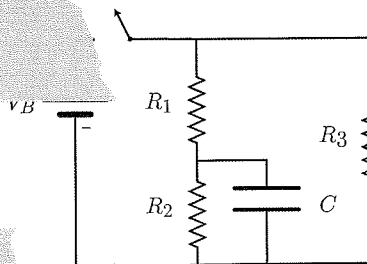


- A.  $N_1 = 50$  and  $N_2 = 10$ .
- B.  $N_1 = 100$  and  $N_2 = 4,000$
- C.  $N_1 = 200$  and  $N_2 = 6,000$ .
- D.  $N_1 = 2,000$  and  $N_2 = 50$ .
- E.  $N_1 = 2,000$  and  $N_2 = 20,000$ .



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- A.  $I = 0.6 \text{ A}$   
B.  $I = 0.9 \text{ A}$   
☒ C.  $I = 1.2 \text{ A}$   
D.  $I = 5.0 \text{ A}$   
E.  $I = 6.0 \text{ A}$

- ☒ A. Increases with time  
☐ B. Decreases with time  
☐ C. Remains constant with time

- A.  $10 \mu\text{s}$   
☒ B.  $6.7 \mu\text{s}$   
C.  $1 \mu\text{s}$   
D.  $0.1 \mu\text{s}$   
E.  $0.67 \mu\text{s}$

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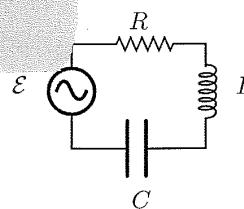
Component values:

$$\varepsilon = 200 \sin \omega t \text{ V}$$

$$L = 5 \text{ mH}$$

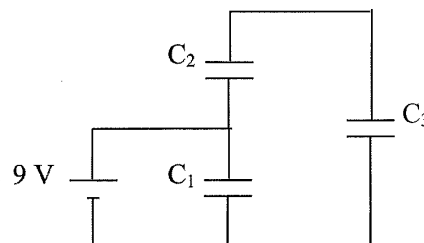
$$C = 10 \text{ } \mu\text{F}$$

$$R = 30 \text{ } \Omega$$



- A. 0 Hz
- B.  $3.55 \times 10^{-5} \text{ Hz}$ .
- ☒ C. 712 Hz
- D.  $4.47 \times 10^3 \text{ Hz}$ .
- E.  $3.18 \times 10^6 \text{ Hz}$ .

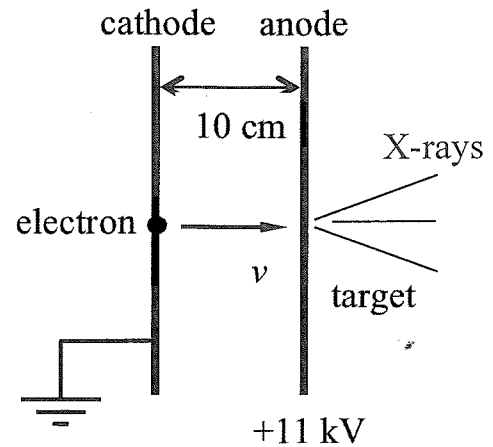
- A.  $Q_3 = 18.3 \text{ } \mu\text{C}$
- B.  $Q_3 = 21.4 \text{ } \mu\text{C}$
- ☒ C.  $Q_3 = 13.5 \text{ } \mu\text{C}$
- D.  $Q_3 = 30.8 \text{ } \mu\text{C}$
- E.  $Q_3 = 33.7 \text{ } \mu\text{C}$



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*The next three questions refer to the situation described below.*

Electrons are accelerated from rest, at the cathode, by an electric potential of +11 kV, before striking the anode 10 cm away.



- A.  $v = 9.1 \times 10^5 \text{ m/s}$   
 B.  $v = 7.3 \times 10^6 \text{ m/s}$   
 C.  $v = 2.3 \times 10^7 \text{ m/s}$   
 D.  $v = 6.2 \times 10^7 \text{ m/s}$   
 E.  $v = 4.1 \times 10^8 \text{ m/s}$

- A.  $\sigma = 0.49 \mu\text{C}/\text{m}^2$   
 B.  $\sigma = 0.97 \mu\text{C}/\text{m}^2$   
 C.  $\sigma = 1.24 \mu\text{C}/\text{m}^2$   
 D.  $\sigma = 1.56 \mu\text{C}/\text{m}^2$   
 E.  $\sigma = 1.95 \mu\text{C}/\text{m}^2$

- A. to the right on the right side of the tube, and to the left on the left side of the tube.  
B. to the left on the right side of the tube, and to the right on the left side of the tube.  
C. the field will be zero everywhere to the left of the cathode and to the right of the anode.