Form A:	2. B	3. B	4. D	5. A	6. D
Form B:	2. D	3. B	4. B	5. D	6. A
Form C:	2. A	3. D	4. B	5. B	6. D
Form D:	2. D	3. A	4. D	5. B	6. B

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7. 

$Q = -1.60\times10^{-19}\,C$ $\quad v = 1.00\times10^{8}\,m/s$

$B = 2.50\times10^{-3}\,T$ $\quad \vec{F}_M = ?$

(A) $F_M = |Q|vB|\sin\theta| = |-1.60\times10^{-19}|(1.00\times10^{8})(2.50\times10^{-3})|\sin 90^\circ|$

$F_M = \underline{4.00\times10^{-14}\,N}$

(B) Using the RHR, thumb $= \hat{v}$ = to the east
1st finger $= \hat{B}$ = to the north
2nd finger $= \hat{F}_M$ = up

However, the electron is negatively charged which reverses the above answer. So, $\hat{F}_M$ = down.

8. $B = 2.50\times10^{-7}\,T$ $\quad S = I = ?$

$S = \dfrac{EB}{\mu_0}$ $\quad E = Bc$ $\quad B = \dfrac{E}{c}$

$$S = \frac{E(E/c)}{\mu_0} = \frac{E^2}{c\mu_0} = \frac{(Bc)B}{\mu_0} = \frac{B^2c}{\mu_0}$$

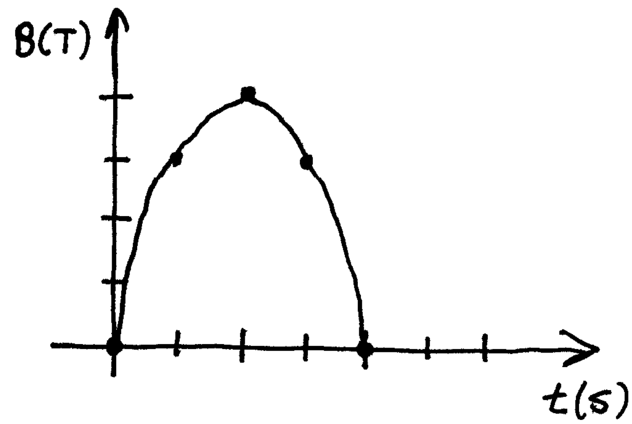
$$S = I = \frac{(2.50\times10^{-7})^2(3.00\times10^{8})}{(4\pi\times10^{-7})}$$

$S =$ [illegible] $I = \underline{14.9\ W/m^2}$

9. $R = 10.0\,cm = 0.100\,m$ $\hat{B} = \odot$ $B(t) = 4t - t^2$

(A)

$t(s)$	$B(T)$
0	0
1	3
2	4
3	3
4	0



(B) Using the <u>RHR</u>, $\hat{B} = \odot =$ thumb

$\hat{I}$(primary) = <u>ccw</u> = direction fingers curl

(C) $\Phi_M = BA|\cos\theta|$

at $t = 3.00$ sec, B is <u>decreasing</u> (from the above graph)

A is <u>constant</u> (same size wire)

θ is <u>constant</u> (wire is stationary)

Therefore, magnetic flux is <u>decreasing</u>.

(D) Since the flux is decreasing, the induced current will try to make it increase by <u>Lenz's Law</u>.

The flux will increase if the primary and induced magnetic fields are in the same direction.

The fields will be in the same direction if the currents are in the same direction.

Therefore, $\hat{I}$(induced) = $\hat{I}$(primary) = <u>ccw</u>