

2003

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(2)	(19) (70)	(140)		인
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()

1. 7

. (2)

1. ' ' 3 10
()
,
,
,
.....
2. 가 ,
가 .
가 .
가 ,
() ()

1-1. () . (1)

1-2. ' ' ()
. (1)

2. . (4)

(A): 0.2 kg, 0.4 kg, 0.6 kg, 0.8 kg, 1.0 kg
가

(B): 0.2 kg, 0.4 kg, 0.6 kg, 0.8 kg, 1.0 kg
가 가

(C):
가 가 . 0.5 kg
가 가

2-1. 가 (A), (B), (C)
. (2)

2-2. 가 . (2)

3. 가 _____

.....
: 가
?
:
: ? 가 ,
?
: 1/4

. (4)

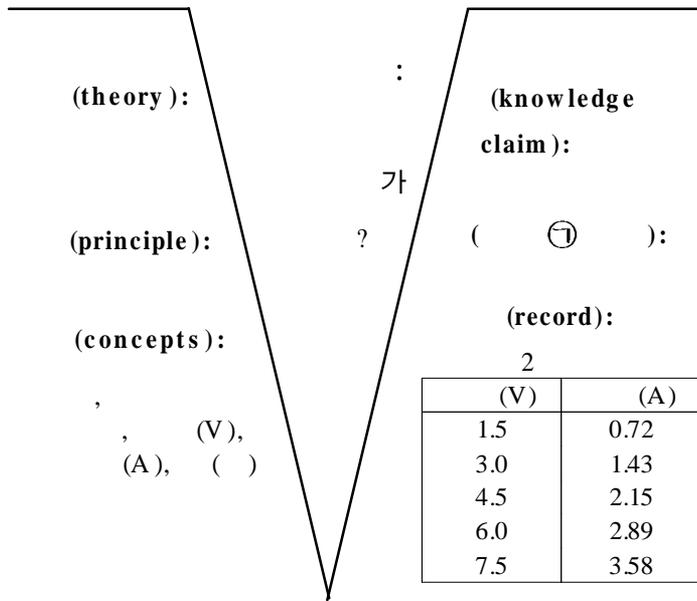
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4.

diagram) .
 . (4)



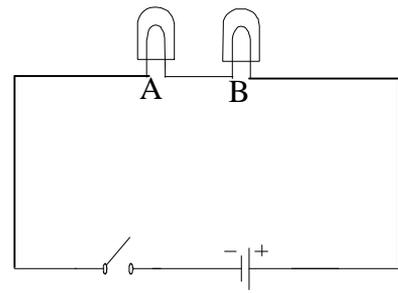
4-1.

4-2.

4-3.

5.

A B
 . (4)



5-1.

B 가
 가 < > . (2)

(A):

(B):

5-2.

< > 가
 . (2)

:

:

:

:

가

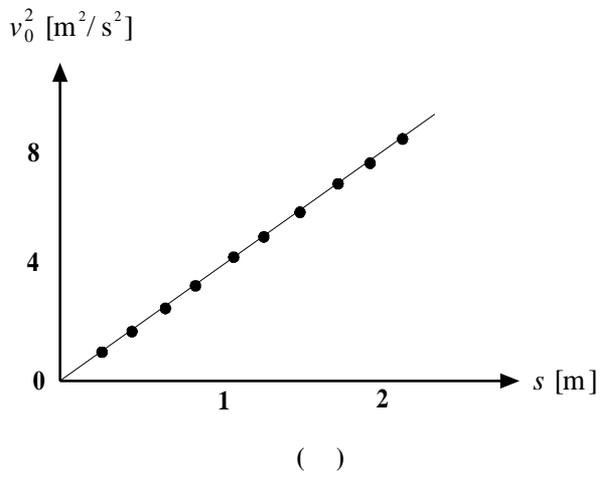
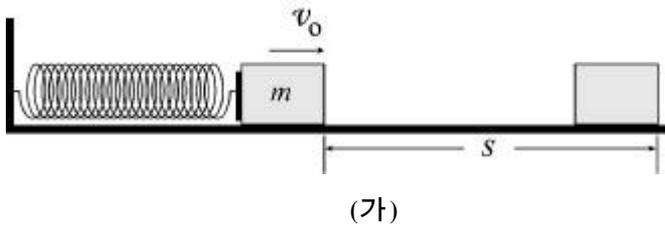
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6. μ_k 가 (가) 가

. v_0 가 가 .
 s
() 가 $g = 10 \text{ m/s}^2$
가 . (4)



6-1. . (2)

6-2. ,
. (1)

6-3. 가 10 cm
가 s_0 , 가 20 cm 30 cm
. (1)

7. 가 가 .
가 N_0 가 $\frac{1}{2}N_0$
 $\frac{1}{8}N_0$ 가 20 . (2)

7-1. . (1)

7-2. 가 N_0
 $\frac{1}{64}N_0$ 가 . (1)

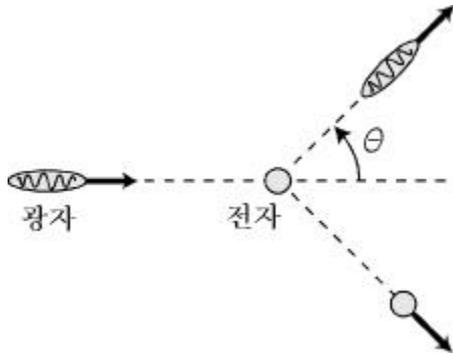
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8. (Compton)

가 $\theta = 90^\circ$
 $\theta = 180^\circ$
. (3)

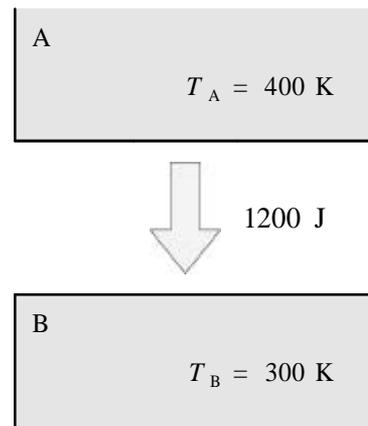


8-1. 가 $\theta = 90^\circ$,
 $\theta = 180^\circ$. (2)

- 90° :
- 180° :

8-2. 8-1 가
(1)

9. $T_A = 400 \text{ K}$ A
 $T_B = 300 \text{ K}$ B 1200 J
가 . (4)



9-1. A B ΔS_A ΔS_B
. (2)

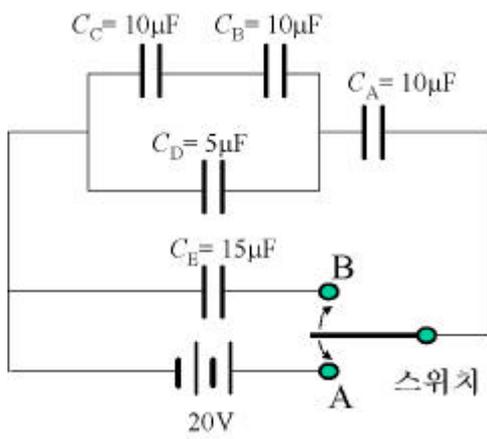
9-2. 9-1 2
. (2)

: ()

: ()

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10. (4)



10-1. A 20V

C_A C_B V_A V_B
 . (2)

10-2.

B A C_E
 . (2)

11. N , V (

$$\Omega \quad \Omega(E, V, N) = f(N) V^N E^{3N/2}$$

$f(N)$ N , E
 . (3)

11-1. (1)

11-2. E
 (1)

11-3. N N
 Ω K
 . (1)

$$\Omega(E, V, N) =$$

12. 가 L m

$$V(x) = \begin{cases} 0, & 0 < x < L \\ \infty, & x < 0, x > L \end{cases}$$

(2)

: ()

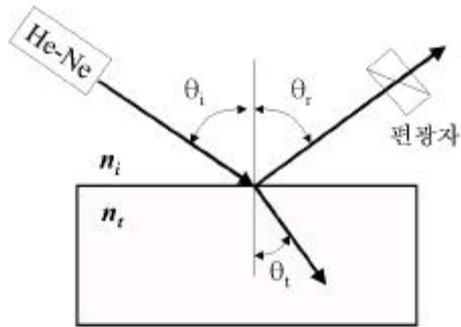
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13. (He-Ne)

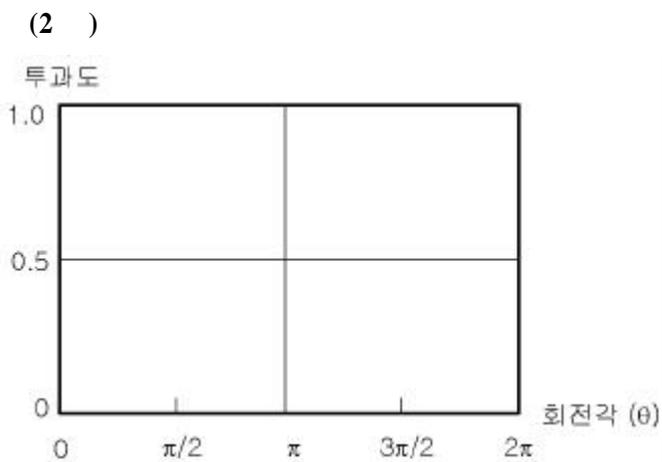
가 ($n_i = 1$)
($n_t = 1.5$)

θ_i 가 $\tan \theta_i = \frac{n_t}{n_i}$
(Brewster)
(4)



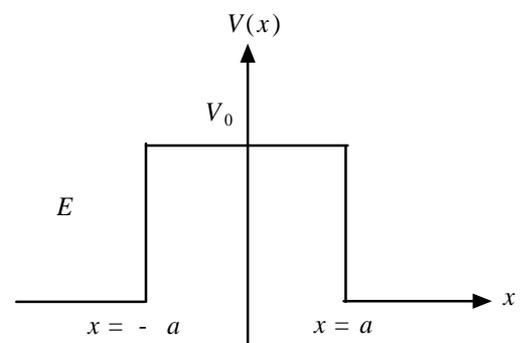
13-1. () ,
(1)

13-2. 가
($\theta = 0$)
 θ



13-3. θ_i θ_r
 $\theta_i + \theta_r = 90^\circ$ 가 (1)

14. $x = -a$ $x = -\infty$ $x = \infty$
 $x = a$.
 m 가
가 $E > V_0$ ($-a < x < a$)
가 $E < V_0$
(3)



(1) :

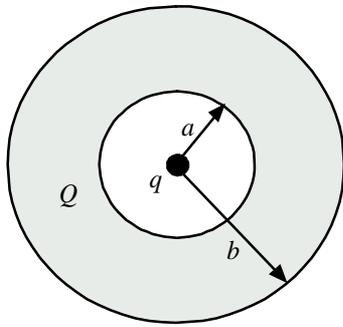
(2) :

: ()

: ()

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15. Q 가
 q 가 .
 a b .
 ϵ_0 , SI . (4)

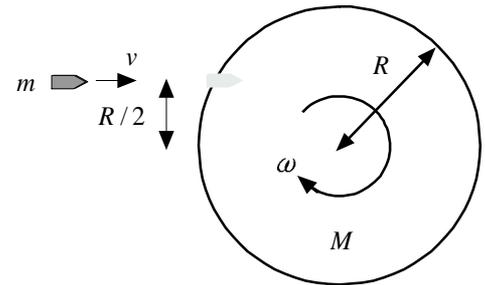


15-1. r $r < a$
 E . (1)

15-2. $a < r < b$ E
 . (2)

15-3. q $\frac{a}{2}$
 W . (1)

16. M , R
 m v
 가 . 가 $\frac{R}{2}$
 ω . M
 m 30 ,
 $\frac{1}{2}MR^2$. (6)



16-1. . (1)

16-2. , m R
 . (2)

16-3. ω . (2)

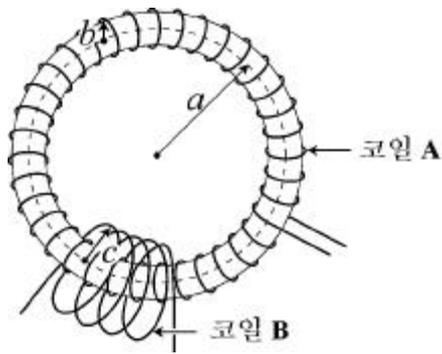
16-4. 가 .
 (1)

: ()

: ()

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17. a N
 (A). $b (b \ll a)$
 n c
 ($c \ll a, c > b$) (B).
 μ_0
 , SI (4)

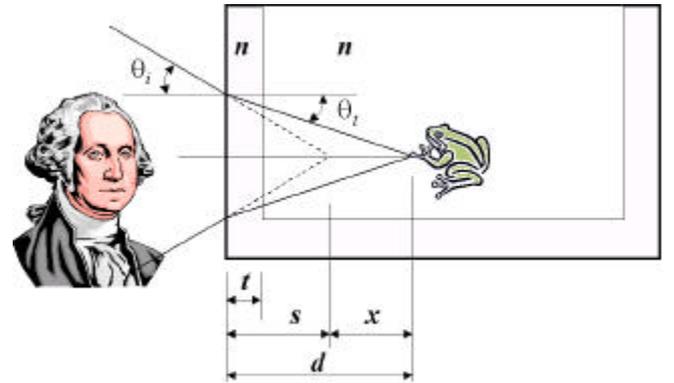


17-1. A I_A 가
 ,
 (1)

17-2. A B
 . (1)

17-3. 17-2 B
 $I_B = I_0 \cos \omega t$ 가 I_B
 A . (2)

18. n 가 t
 가 ,
 가 . (1)
 (3)



18-1. 가 d .
 s n d
 . (θ_i
 θ_i $\sin \theta_i \approx \theta_i$ $\sin \theta_i \approx \theta_i$
 가 .) (2)

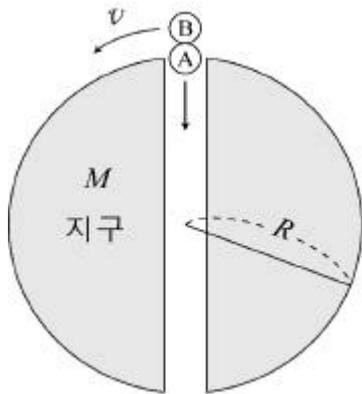
18-2. ,
 s d x
 t n . (1)

: ()

: ()

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19. M , R 가 .
 A, B 가 . m .
 A ,
 B ,
 v .
 B G .
 (6)



19-1. 가 r . (2)
 ($r < R$) (g)

19-2. 19-1 A
 r . (1)

19-3. A T_A B T_B
 . (2)

19-4. A, B가 ,
 . (1)