

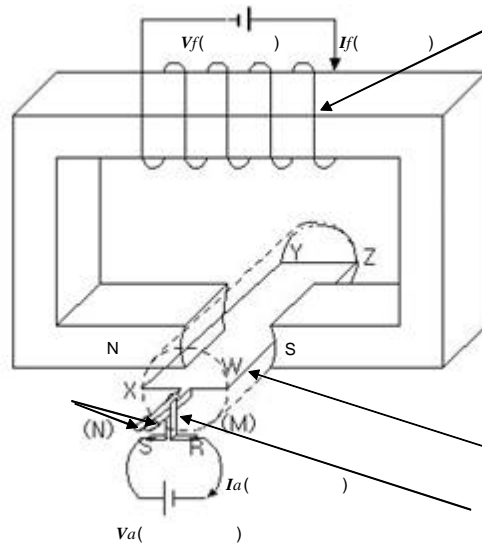
-DC

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3

DC

DC



(motor)

(DC motor)

(AC motor)

(1) DC
DC

(界磁鐵心)

1

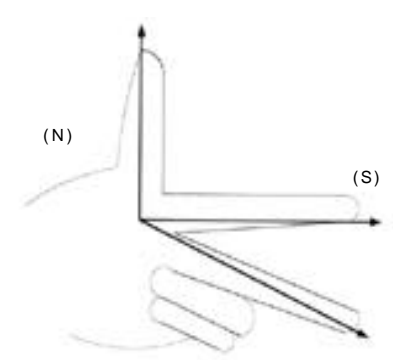
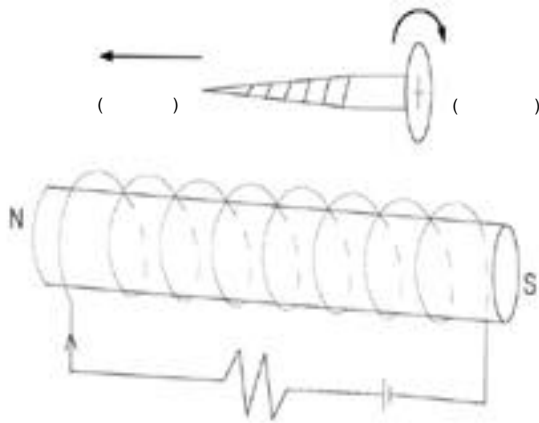
1. DC

가

(電機子鐵心)

()

X - Y -



2.

3.

Z - W

1

1

R

M

W Z Y X 가 ,
N, S

(commutator)

W - Z Y - X
W - Z

가

1

I_f가

가

I_a

R

가 M

N

I_f가

2

N, S

Y - X
W - Z

가

N

I_f

S

I_a

I_f,

()

I_a

()

3

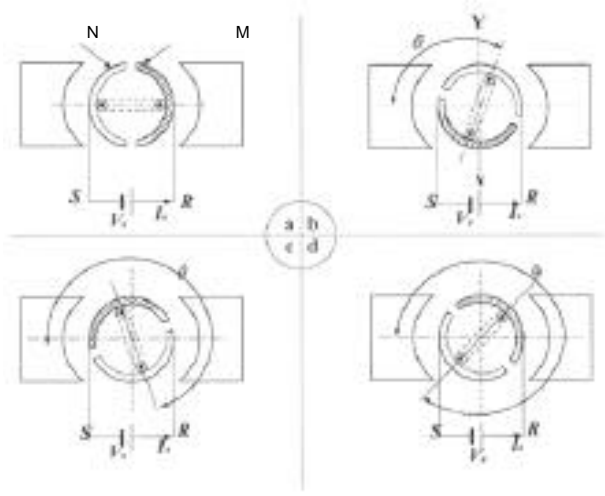
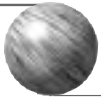
(2)

DC

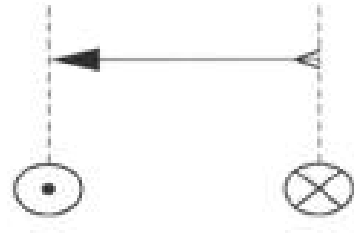
가

가 DC

1



4.



5.

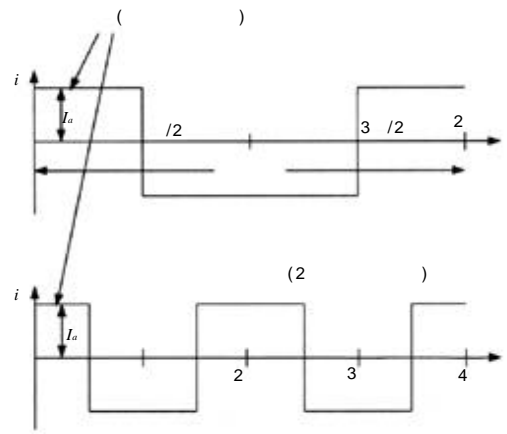
YY' 가
YY' 가
가

4

M 1 W-Z
N X-Y
5
가
0 < < /2
M R N S가

6
() DC
() 가
6 가

= /2 가 (4(b), (c))
N 가 가
4(a)
가 1/2 < < 3 /2
가 가 3 /2
(d)
M 4(a)



6.

(3)

가 7(a) N S

$$= x \cos \quad (2)$$

T, 가 (c)

$$T = (\quad) \times (\quad) \quad (1)$$

. cos 가

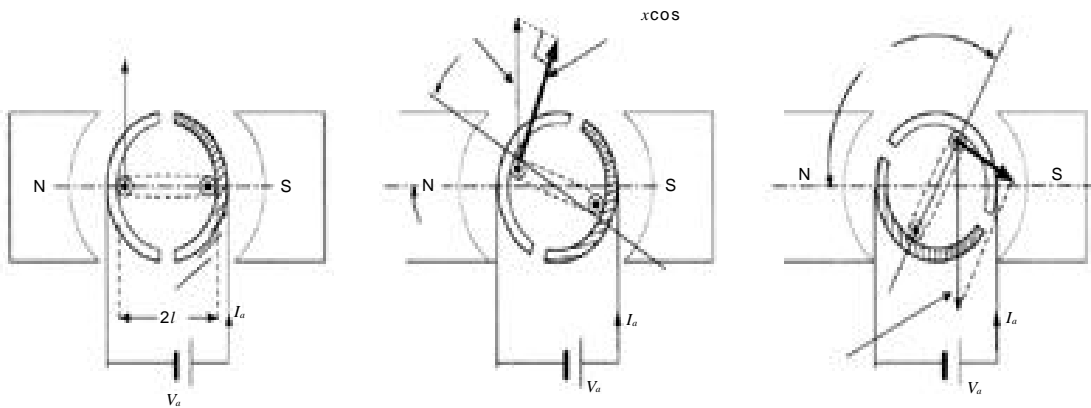
8 ,

(b)

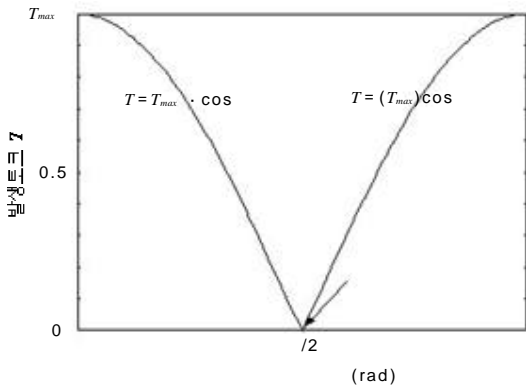
7(a)

7

8



7.



8.

$$= / 2$$

가 0

90°

2

9(a)

가

가

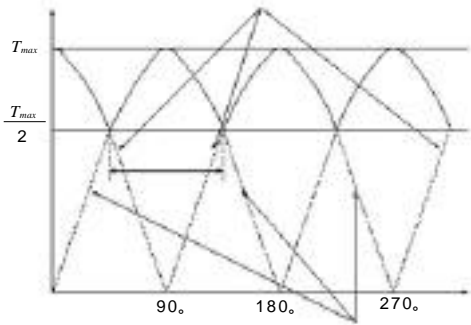
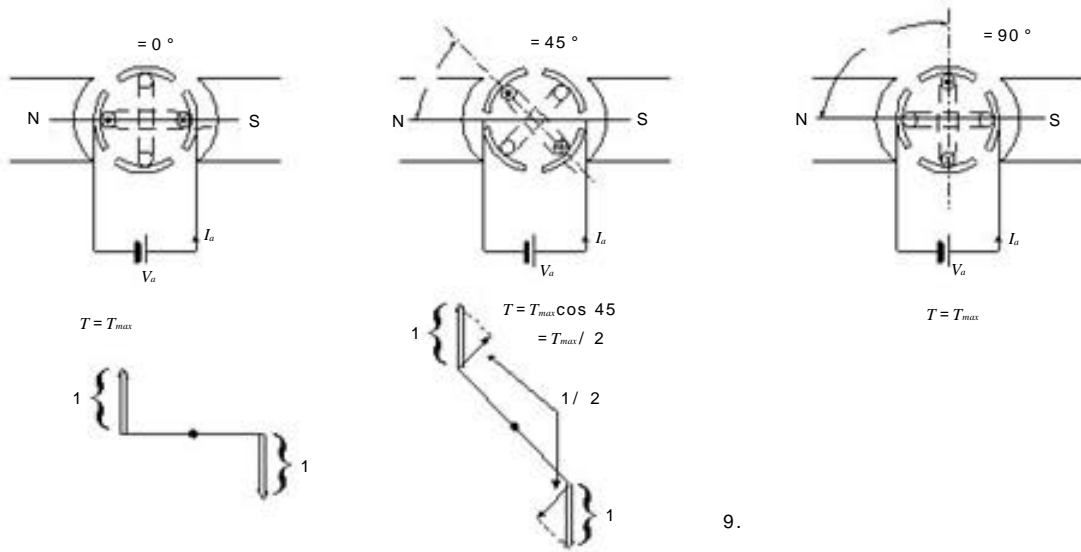
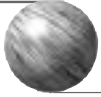
0 < < 45°

(2)

가

9(b) < 45° ,

가



10. 2

가
 $15^\circ (180^\circ / 12 = 15^\circ)$
 (N S
 $\pm 7.5^\circ$
)
 가
 $\cos 7.5^\circ$
 가

(4) DC
 DC 1
 2

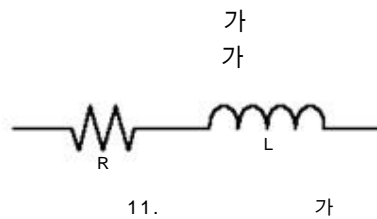
9(a) 1/2 가 45°
 가

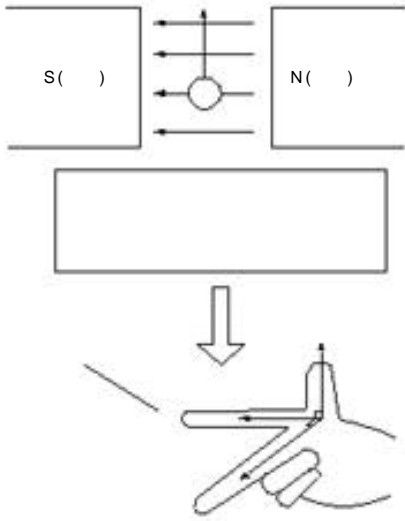
DC 11
 가

(a) =90° (9(c) 9

R L 가
 1 11

10 2
 1 가0 가
 가





12.

11

12

E

$$E = k \times \dots \quad (3)$$

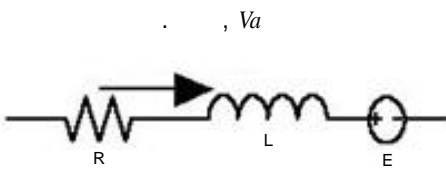
k

7(a)

가

가

가



13.

가

14 가 가
(3) (磁
路)

H μ

m[rad/s]

$$E = K_c \cdot I_f \cdot \dots \quad (4)$$

(1) (2)

가 가 가 가
, cos 0 1 , (1)

$$T = \dots \times \dots \quad (5)$$

I_f

$$T = K_t \cdot I_f \cdot I_a \quad (6)$$

DC

1

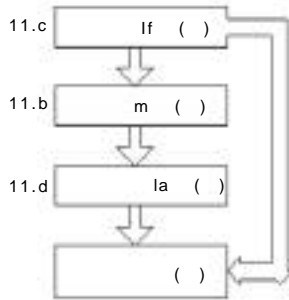
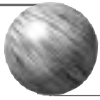
12

$$v_f = R_f \cdot i_f + L_f \frac{di_f}{dt} \quad (7)$$

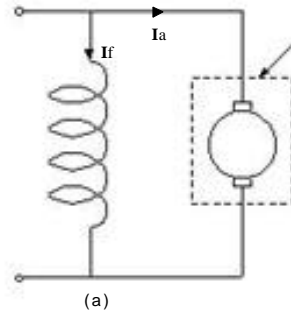
14

가

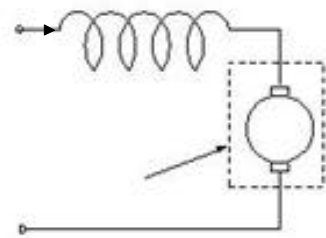
$$v_a = R_a \cdot i_a + L_a \frac{di_a}{dt} + e \quad (8)$$



14.



(a)



(b)

15. DC

e (4)

$$T = K_t \cdot I_f \cdot I_a \dots (11d)$$

$$e = K_e \cdot i_f \cdot m \dots (9)$$

(5)

t (6)

(11)

(steady state)

$$= K_e \cdot i_f \cdot m \dots (10)$$

(11)

(11d)

4

DC
DC

(11b, c)

가

Ia

Va가

가

(11d)

If

15(a)

15(b)가

Ia

(11b)

(b)

e

Ia가 가

E가

m

가

14

$$i \quad IV \quad V' \quad m \quad m$$

가

가

$$\frac{di}{dt} = 0$$

(11b, c)

$$R_a I_a \ll E$$

15

가 (7) ~ (10)

(a)

I가

가

(卷上機)

가

14

가

15(b)

$$V_f = R_f \cdot I_f \dots (11a)$$

$$V_a = K_e \cdot I_f \cdot m \dots (11b)$$

$$E = K_e \cdot I_f \cdot m \dots (11c)$$

가