**1.1**

**1.2**

(a)

(b)

(c)

**1.3**

**1.4**

a.

b.

c.

**2.1**

**1) volt**

**2)**

**3)**

**2.2**

,

,

The ratio is 2 : 1

**2.3**

**2.4**

d 1.5배 증가 🡪 Oe 2.25배 증가

**2.5**

At Helmholtz coil:

Total length

 Oe

At solenoid

 Oe

Total length =

**2.6**

**2.7**



**2.8**

 ->

**2.9**

*μr=5000====1+ , S0 =4999 , M=4999H*

*(in the body) B1=μ0(Ha-Hb)+μ0M=μ0(Ha+M-NdM)= μ0[Ha+(4999)Ha-(4999HaNd)]=μ0(5000-4999Nd)Ha*

*(original field) B2= μ0Ha*

 *The ratio=B1/B2=5000-4999Nd*

*(a) =1 Nd= (SI) , B1/B2=3333.67*

*(b) =5 Nd=0.056 (SI) , B1/B2=4720.06*

*(c) =100 Nd=4.310-4 (SI) , B1/B2=4998*

*(d) =∞ Nd=0 (SI) ， B1/B2=5000=μr*

*(Use Nd=[ln(m+, m=(axial ratio)]*

**2.10**

(c)

Slope =

(d) if permeability is large,

Slope=

**2.11**

 ,m=V=10.48g/cm3(0.5cm)2=123.4g (a)

Fx=g ====0.00602=6.02mg (b)

450$/kg=55.53$ (c)