

## Exp.8: Magnetic field of the Earth

Name: .....**Model Data Exp**..... Day and Date: .....

Student's No.: ..... Sec.: .....

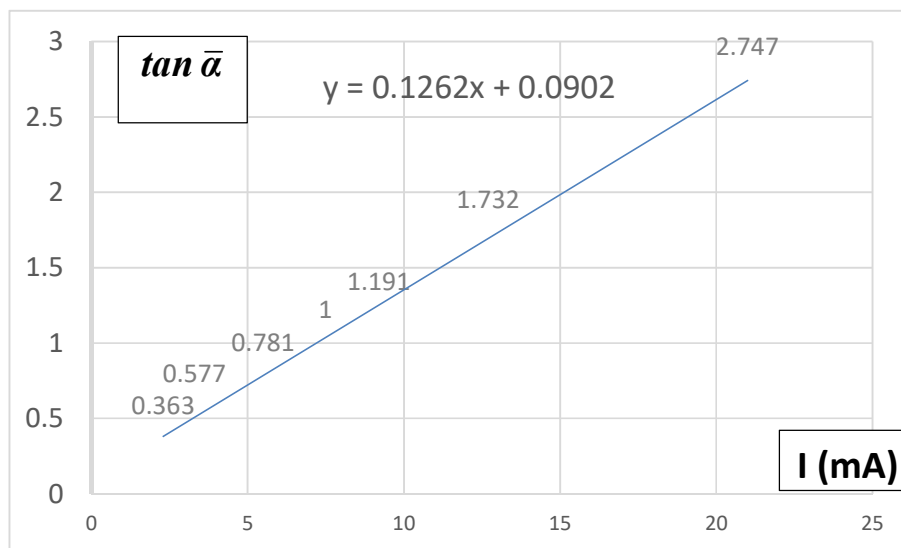
Partners Names: .....

### Data and Calculation

$r = 7.5 \text{ cm}$     $N = 500 \text{ turns}$

$\tan \bar{\alpha}$	$\bar{\alpha}$	I ( mA)
0.363	20	2.3
0.577	30	3.3
0.781	38	5.5
1	45	7.5
1.191	50	9.2
1.732	60	12.7
2.747	70	21

Plot  $\tan \alpha$  vs. I, from the slope determine  $B_e$ .



$$\tan \alpha = \frac{\mu_0 N}{2rB_{eh}} I, \quad \Rightarrow \frac{\tan \alpha}{I} = S = \frac{\mu_0 N}{2rB_{eh}} = 0.126 \times 10^3$$

$$B_e = \frac{\mu_0 N}{2r} \cdot \frac{I}{S} = 418.9 \times 10^{-5} \cdot \frac{I}{S} = \frac{418.9 \times 10^{-5}}{126} = 33.2 \mu T$$