ELEC ENG 3PI4
Lab 2
Transformer Characteristics

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Experiment A.1:

Load Type	Voltage (V)	Current (mA)
None	240.1 V	31 mA
Resistive	215.8 V	102.6 mA
Inductive	232.4 V	48.2 mA
Capacitive	253.2 V	101.2 mA

Experiment B.1:

$R_1 = 13.8\ \Omega$

$R_2 = 44.3\ \Omega$

$R'_2 = R_2(N_1/N_2)^2 = 11.14\ \Omega$

Experiment B.2:

$V_{OC} = 120.8$ V

$P_{OC} = 2.2$ W

$I_{OC} = 0.03$ A

$S_{OC} = 4.6$ VA

$PF_{OC} = \cos\phi_{OC} = P_{OC}/S_{OC} = 0.478$

$\phi_{OC} = \cos^{-1}(PF_{OC}) = 61.45$ deg

$G_{fe} = (I_{OC}/V_{OC})\cos\phi_{OC} = 1.187*10\text{^-}4$ S

$R_{fe} = 1/G_{fe} = 8424\ \Omega$

$B_H = (I_{OC}/V_{OC})\sin\phi_{OC} = 2.18*10\text{^-}4$ T

$X_H = 1/B_H = 4587\ \Omega$

Experiment B.3:

Rated current = (145mA)((682*2) / 684) = 289.15 mA

V_{SC} = 11.93 V

P_{SC} = 2.1 W

I_{SC} = 0.29A

S_{SC} = 3.4 VA

$PF_{SC} = \cos\phi_{SC} = P_{SC}/S_{SC} = 0.6176$

$\phi_{SC} = \cos^{-1}(PF_{SC}) = 51.859$ deg

$R_{eq} = (V_{SC}/I_{SC})\cos\phi_{SC} = 25.41\ \Omega$

$X_{eq} = (V_{SC}/I_{SC})\sin\phi_{SC} = 32.355\ \Omega$

Experiment C.1 - WYE-WYE Connection:

Primary Line	A (rms)	Secondary Phase Voltage	V (rms)
I_{1A}	**220.2**	V_{2A}	**215.7**
I_{1B}	**220.2**	V_{2B}	**215.7**
I_{1C}	**220.2**	V_{2C}	**215.7**

Experiment C.2 - DELTA-WYE Connection:

Primary Line	A (rms)	Secondary Phase Voltage	V (rms)
I_{1A}	**223.4**	V_{2A}	**216.6**
I_{1B}	**223.4**	V_{2B}	**216.6**
I_{1C}	**223.4**	V_{2C}	**216.6**