CLO #1: Investigate a transformer circuit using Faraday's Law and electric circuit theory

[marks 20]

Q1:

A 60000VA, 4000/230V single phase distribution transformer has series impedance referred to the primary of 12 + j45 Ω. The components of the excitation branch referred to the secondary side are R_C = 50 Ω *and* X_M =j 60 Ω. Assume a secondary current of 200A with a lagging PF of 0.7547 is provided to a load at rated secondary voltage.

a) Draw circuit model referred to secondary side, LV
b) Investigate the circuit to find out Voltage regulation
c) Find out applied primary voltage
d) Find out real power input to the transformer

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[marks 5+5+5+5=20]

Q2:

Draw B-H curve for DC excitation for a ferromagnetic material, clearly indicate knee point, saturation portion and linear portion

Name two types of losses that occur in a transformer's core.

Draw phasor diagram of a transformer for capacitive load

Draw the schematic diagram to perform short circuit test on a transformer.

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