Lecture-38
Tutorial

Lecture delivered by:

Objectives

At the end of this lecture, student will be able to:

- Solve the problems on the voltage regulation
- Solve the problems on the transformer efficiency

Problem 1:

A 20KVA, 2000/200V, single-phase transformer has the following parameters

HV winding R_1=3 ohms X_1=5.3 ohms

LV winding R_2=0.05 ohms X_2=0.05 ohm

Find the voltage regulation at 0.8 power factor lagging and 0.707 Pf leading.

Problem 2:

The Parameters of the equivalent circuit of a 100kVA,2000/ 200 volts 1-phase transformer are as follows

Primary resistance = 0.2ohms

Secondary Resistance = 2 milli ohms

Primary leakage reactance = 0.45ohms

Secondary leakage reactance = 4.5 milli ohms

Core loss resistance = 10kilo ohms

Magnetizing reactance = 1.55 kilo ohms

Using the circuit referred to primary, determine the

1)Voltage regulation

2) Efficiency of the transformer operating at rated load with 0.8 lagging power factor

Problem 3:

A 25 kVA 2200/220 V, 50 Hz distribution transformer is tested for efficiency and regulation as follows:

O.C. test (l.v side) : 220V,4 A, 150W

S.C test (h.v. side) : 90 V,10A, 350W

Determine

1) Core loss
2) Equivalent resistance referred to primary and secondary
3) Equivalent Reactance referred to primary and secondary
4) Regulation of transformer at 0.8 power factor lagging current and
5) Efficiency at full –load and half load at 0.8 power factor lagging current