THE UNIVERSITY OF ZAMBIA
SCHOOL OF ENGINEERING
Dept of Electrical & Electronic Engineering

EEE 3352: Electromechanics and Electrical Machines

ASSIGNMENT 3: SINGLE PHASE TRANSFORMERS *(Due 22/10/2022)*

1.

An ideal 3300/250-V, 50-Hz, single-phase transformer has a core of effective cross-sectional area of 13000 mm^2 and a low-voltage winding of 80 turns. Determine the number of turns on the high-voltage winding and the maximum flux density in the core.

2.

A single-phase transformer is rated at 10 kVA, 240/100 V. When the secondary terminals are open-circuited and the primary winding is supplied at normal voltage, the input current is 2.6 A at a power factor of 0.3 lag. When the secondary terminals are short-circuited, a voltage of 18 V applied to the primary causes the full-load current to flow in the secondary, the power input to the primary being 240 W. Calculate

(a) the regulation
(b) the efficiency of the transformer at full load, unity power factor
(c) the load at which maximum efficiency occurs
(d) the value of the maximum efficiency.

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