

Unit 5 - Week 4

Course outline

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Week 2

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Week 4

- Auto-transformers
- PU notation and Introduction to Instrument transformers
- Instrument Transformers and All Day Efficiency

Quiz : Assignment 4

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Solutions for Assignments

Assignment 4

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-08-28, 23:59 IST.

For Question 1 and 2

Test data on a single-phase transformer with the secondary terminals short circuited is given below.
Applied voltage: 60 V, current :100 A, power input: 1.2 KW.

1) Calculate (from the primary side) effective (equivalent) resistance in Ω

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.11,0.13

1 point

2) Calculate (from the primary side) leakage reactance in Ω .

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.56,0.62

1 point

For Question 3 and 4

A 50 Hz single-phase transformer has a turns ratio of 6. The resistances and reactances are 0.90Ω and 1.5Ω for HV winding and 0.13Ω and 0.1855Ω for low voltage winding respectively.

3) Calculate the voltage to be applied to the high voltage side to obtain full load current of 200 A in the low voltage winding on short circuit.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 229,332

1 point

4) Calculate the power factor on short circuit.

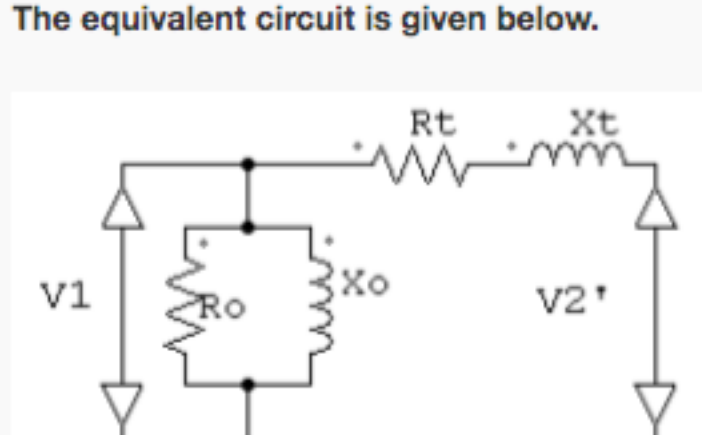
No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.54,0.58

1 point

For question 5 to 8

The test results of a single-phase, 4 KVA, 200/400 V, 50 Hz transformer are given below.
Open circuit: 200 V, 0.7 A, 70 W on low voltage (primary) side.
Short circuit: 15 V, 10 A, 80W on high voltage (secondary) side.
The equivalent circuit is given below.



5) Calculate the value of R_0 in Ω

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 570,572

1 point

6) Calculate the value of X_0 in Ω

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 329,333

1 point

7) Calculate the value of R_t in Ω

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.18,0.22

1 point

8) Calculate the value of X_t in Ω

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.3,0.33

1 point

For Question 9 and 10

The efficiency of a 400 KVA, single-phase transformer is 98.77% when delivering full load at 0.8 power factor and 99.13% at half load and unity power factor.

9) Calculate the iron loss in kW

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.98,1.06

1 point

10) Calculate the full load copper loss in kW

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 2.9,3.1

1 point

11) 16A, 200 kVA single phase transformer is in circuit throughout 24 hours. For 8 hrs in a day, the load is 150 kW at 0.8 power factor lagging and for 7 hours, the load is 90kW at 0.9 power factor. Remaining time or the rest period is at no load condition. Full load copper loss is 4 kW and the iron loss is 1.8 kW. Calculate the all-day efficiency (in %) of the transformer.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 95,96

1 point

For Questions 12 to 14

A 100 kVA, 50 Hz, 440/11000 V, single phase transformer has an efficiency of 98.5% when supplying full load current at 0.8pf and an efficiency of 99% when supplying half of full load current at unity power factor.

12) Find the iron loss in watts

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 264,270

1 point

13) Find the copper losses (in watts) corresponding to full load current.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 945,955

1 point

14) Calculate the load current (in A) at maximum efficiency.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.5,5

0 points

15) A 40 KVA transformer has got a maximum efficiency of 97 % at 80% of rated load at UPF. During a full day it is loaded as follows:

9 hrs - 6 KW - 0.6 lag(pf)

8 hrs - 25 KW - 0.8 lag

7 hrs - 30 KW - 0.9 lag

Calculate its all-day efficiency.

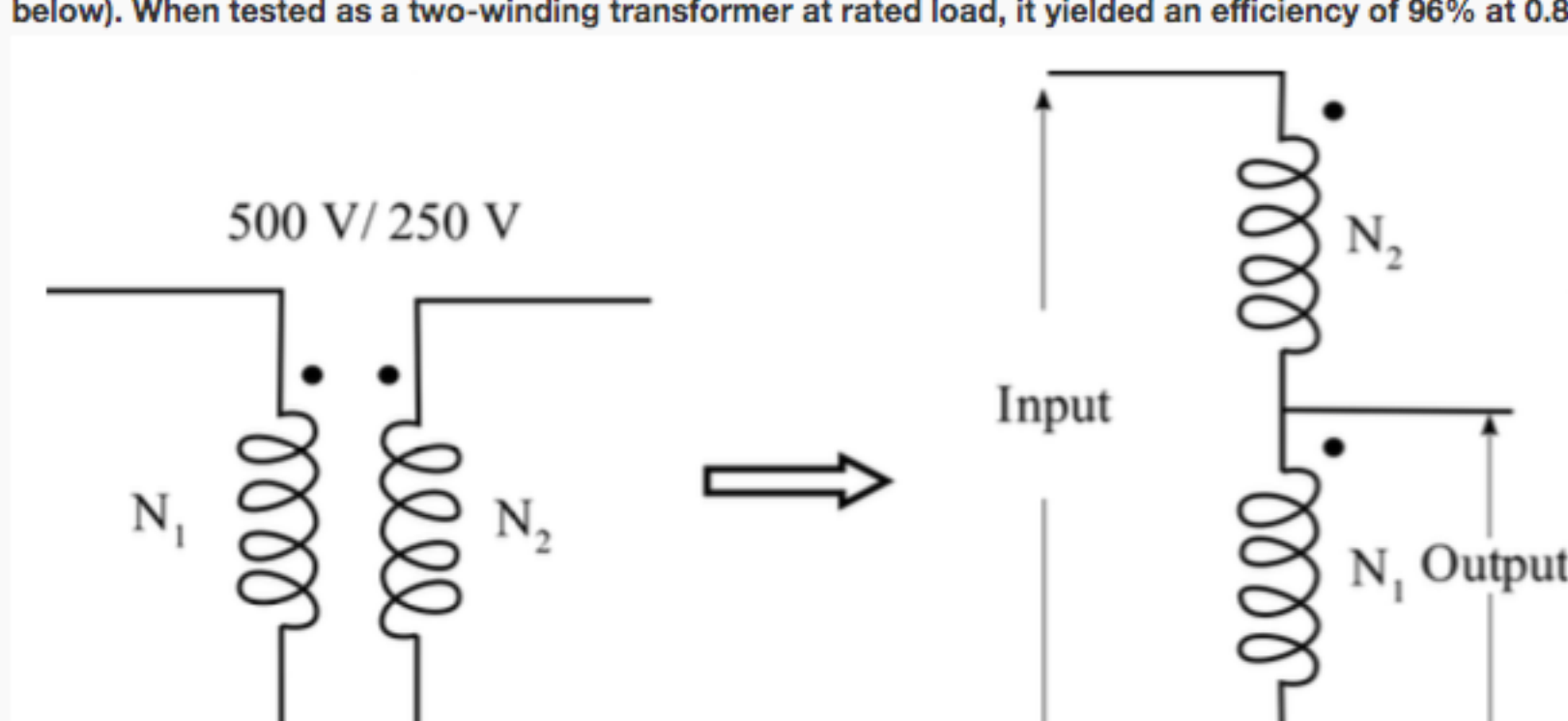
No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 95.5,96.8

1 point

For Question 16 and 17

A 500/250V, 5 kVA two-winding transformer is to be used as an auto transformer to supply a 500 V circuit from a 750 V source at 50 Hz (as shown below). When tested as a two-winding transformer at rated load, it yielded an efficiency of 96% at 0.8 PF lagging.



16) Determine its kVA rating as an auto-transformer.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 14.99,15.01

1 point

17) Find its efficiency at full load at 0.8 PF lagging as an auto-transformer.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 98,99

1 point