

## Unit 6 - Week 3

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### Week 3 Assignment 3

The due date for submitting this assignment has passed. **Due on 2019-08-21, 23:59 IST.**  
As per our records you have not submitted this assignment.

#### Common data for Question 1 to 2:

Calculate in terms of the primary the effective (equivalent) resistance and the leakage reactance of a transformer which gave the following data on test with the secondary terminals short-circuited; Applied voltage = 60V; current = 100A; power input = 1.2kW.

1) How much is the effective (equivalent) resistance (in  $\Omega$ ) in terms of the primary?

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 0.11,0.13

1 point

2) How much is the effective (equivalent) leakage reactance (in  $\Omega$ ) in terms of the primary?

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 0.57,0.61

1 point

#### Common data for Question 3 to 5:

A 40kVA transformer with a ratio of 2000V/250V has a primary resistance of 1.15 $\Omega$  and a secondary resistance of 0.0155 $\Omega$ .

3) Calculate the total resistance (in  $\Omega$ ) in terms of the secondary winding

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 0.0320,0.0350

1 point

4) Calculate the total resistance drop (in V) on full load

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 5.1,5.6

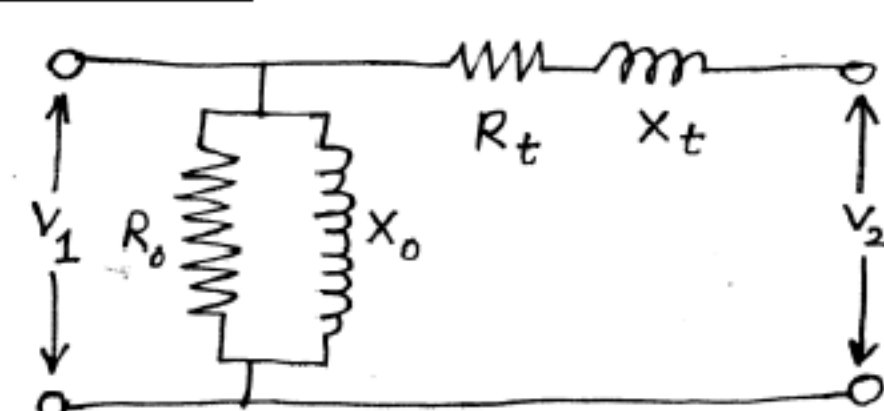
1 point

5) Calculate the total copper loss (in W) on full load

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 852,862

1 point

#### Common data for Question 6 to 9:



The diagram shows the equivalent circuit of a 1-phase, 4kVA, 200V/400V, 50-Hz transformer of which the following are the test results:

Open-circuit: 200V, 0.7A, 70W on low-voltage (primary) side.

Short-circuit: 15V, 10A, 80W on high-voltage (secondary) side.

6) Calculate the value of  $R_0$  (in  $\Omega$ )

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 566,576

1 point

7) Calculate the value of  $X_0$  (in  $\Omega$ )

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 325,335

1 point

8) Calculate the value of  $R_t$  (in  $\Omega$ )

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 0.18,0.22

1 point

9) Calculate the value of  $X_t$  (in  $\Omega$ )

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 0.297,0.337

1 point

#### Common data for Question 10 to 12:

A transformer has Ohmic (resistive) drop of 1% (i.e. per unit equivalent resistance 0.01) and reactance drop of 5% (i.e. per unit equivalent leakage reactance 0.05).

10) Calculate the percentage regulation (with correct + or - sign) when the power factor is 0.8 lagging. (Hint: the regulation value should have + sign if the terminal voltage drops down on connecting the load, and should have a - sign if the terminal voltage goes up on connecting the load)

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 3.75,3.85

1 point

11) Calculate the percentage regulation (with correct + or - sign) when the power factor is unity

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 0.95,1.05

1 point

12) Calculate the percentage regulation (with correct + or - sign) when the power factor is 0.8 leading

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) -2.25,-2.15

1 point

13) Find the percentage efficiency of a 150kVA transformer at 25% load at a power factor of 0.8 lagging, if the copper loss is 1600W at full load and the iron loss is 1400W. Ignore the effects of temperature rise and magnetizing current.

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 94.74,95.74

1 point

14) In a 25-kVA, 2000V/200V transformer, the iron and copper losses are 350W and 400W respectively. Determine the load (in KVA) for maximum efficiency.

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 23.0,23.8

1 point

15) A transformer has its maximum efficiency of 0.98 at 15 kVA at unity power factor. During the day it is loaded as follows:  
12 hours - 2kW at power factor 0.5  
6 hours - 12kW at power factor 0.8  
6 hours - 18kW at power factor 0.9  
Calculate the percentage "all-day" efficiency.

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
(Type: Range) 96.5,97.5

1 point