Started on	Sunday, 9 October 2022, 4:06 PM
State	Finished
Completed on	Sunday, 9 October 2022, 5:14 PM
Time taken	1 hour 7 mins
Grade	**100.0** out of 100.0

Question 1

Correct

Mark 10.0 out of 10.0

A 200-kVA, 50-Hz, 1732 / 240-V single-phase transformer has an iron core cross-sectional area of 22500 mm^2, and the maximum allowable magnetic flux density is 1.4 T. Calculate the number of primary turns N_1. [Whole number, i.e. 0 decimal places].

Answer: 248

The correct answer is: 248

Question 2

Correct

Mark 5.0 out of 5.0

With the information in Question 1, calculate the number of secondary turns N_2. [Whole number, i.e. 0 decimal places]

Answer: 34

The correct answer is: 34

Question 3

Correct

Mark 5.0 out of 5.0

With the information in Question 1, calculate the rated primary current I_1, in A. [Whole number, i.e. 0 decimal places]

Answer: 115

The correct answer is: 115

Question 4

Correct

Mark 5.0 out of 5.0

With the information in Question 1, calculate the rated secondary current I_2, in A. [Whole number, i.e. 0 decimal places]

Answer: 833

The correct answer is: 833

Question 5

Correct

Mark 10.0 out of 10.0

The length of the magnetic circuit of the transformer given in Question 1 is 4 m and the relative permeability is 2000. What is the magnetising reactance X_o, in Ω [Whole number, i.e. 0 decimal places]

Answer: 273

The correct answer is: 272

Question 6

Correct

Mark 5.0 out of 5.0

With information given in the previous questions, what is the magnetising current I_{mag}, in A? [1 decimal place]

Answer: 6.3

The correct answer is: 6.4

Question 7

Correct

Mark 10.0 out of 10.0

With the information in Question 1, what is the iron-loss resistance R_o, in Ω, if the iron loss is 2 kW? [Whole number, i.e. 0 decimal places].

Answer: 1500

The correct answer is: 1500

Question 8

Correct

Mark 5.0 out of 5.0

With the information in previous questions, what is the iron-loss current I_{Loss}, in A? [2 decimal places].

Answer: 1.15

The correct answer is: 1.15

Question 9

Correct

Mark 10.0 out of 10.0

With the information in previous questions/answers and given that the load current I_2 is 200 A at 0.8 power factor lag, what is the supply current I_1, in A? [1 decimal place].

Answer: 34.6 ✔

The correct answer is: 32.7

Question 10

Correct

Mark 5.0 out of 5.0

A 10-MVA transformer has iron losses of 72 kW and full-load copper losses of 200 kW. At what load current **x**, a pure number, does maximum efficiency occur? [1 decimal place]

Answer: 0.6 ✔

The correct answer is: 0.6

Question 11

Correct

Mark 10.0 out of 10.0

A 10-MVA transformer has iron losses of 72 kW and full-load copper losses of 200 kW. What is the maximum efficiency, η_{max}, a pure number? [2 decimal places].

Answer: 0.98 ✔

The correct answer is: 0.98

Question 12

Correct

Mark 15.0 out of 15.0

A 240-V / 110-V transformer has a total resistance of 2 Ω and a total leakage reactance of 4 Ω, both referred to the primary-side. The secondary current is 12 A. What is the regulation at unity power factor? [2 decimal places]

Answer: 0.05

The correct answer is: 0.05

Question 13

Correct

Mark 5.0 out of 5.0

With the information in Question 12, what is the power factor, a pure number, which gives maximum regulation? [2 decimal places]

Answer: 0.45

The correct answer is: 0.45

◄ [2021] LECTURE 4 - EXAMPLES

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[2021] LECTURE 5: ROTATING MACHINES ►