Unit 5 - Week 4

Assignment 4

The due date for submitting this assignment has passed. **Due on 2019-08-28, 23:59 IST.**
As per our records you have not submitted this assignment.

1) To convert line-to-line voltages to line-to-neutral voltages, $[W]$ matrix is used. **2 points**

Then, the $[W]$ matrix in the following equation is given by

$$[VLN_{abC}] = [W][VLL_{abC}]$$

where, $[VLN_{abC}] = [V_{aN} \;\; V_{gN} \;\; V_{cN}]^T$ and $[VLL_{abC}] = [V_{ab} \;\; V_{gc} \;\; V_{ca}]^T$

- $[W] = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & -1 \\ -1 & 0 & 1 \end{bmatrix}$
- $[W] = \begin{bmatrix} 1 & 0 & -1 \\ -1 & 1 & 0 \\ 0 & -1 & 1 \end{bmatrix}$
- $[W] = \frac{1}{3}\begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 1 & 0 & 2 \end{bmatrix}$
- $[W] = \frac{1}{3}\begin{bmatrix} 1 & -1 & 0 \\ 1 & 2 & 0 \\ -2 & -1 & 0 \end{bmatrix}$

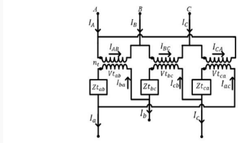
No, the answer is incorrect.
Score: 0

Accepted Answers:

$[W] = \frac{1}{3}\begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 1 & 0 & 2 \end{bmatrix}$

Data for the Q. 2, Q.3 and Q.4: A delta/delta (Dd0) connected transformer with the turns ratio of n_t = 20 is shown in the following figure. The secondary-side delta currents are

I_{ba} = 210.0∠−24.84° A, I_{cb} = 112.0∠−155.32° A, and I_{ac} = 112.0∠84.12° A.



2) The secondary side line currents (A) I_a, I_b, and I_c respectively are **4 points**

- 268.19∠-48.10, 295.26∠171.93, 194.53∠54.4
- 295.26∠171.93, 194.53∠54.4, 268.19∠-48.10
- 194.53∠54.4, 268.19∠-48.10, 295.26∠171.93
- 268.19∠-48.10, 238.83∠176.87, 220.78∠74.4

No, the answer is incorrect.
Score: 0

Accepted Answers:
268.19∠-48.10, 295.26∠171.93, 194.53∠54.4

3) The primary side delta currents (A) I_{AB}, I_{BC}, and I_{CA} respectively are **2 points**

- 5.6∠-155.32, 10.5∠-24.84, 5.6∠84.12
- 10.5∠-24.84, 5.6∠-155.32, 5.6∠84.12
- 10.5∠155.16, 5.6∠24.68, 5.6∠-95.88
- 5.6∠24.68, 10.5∠155.16, 5.6∠-95.88

No, the answer is incorrect.
Score: 0

Accepted Answers:
10.5∠-24.84, 5.6∠-155.32, 5.6∠84.12

4) The primary side line currents (A) I_A, I_B, and I_C respectively are **4 points**

- 4.92∠171.93, 3.24∠54.40, 4.47∠-48.10
- 4.47∠-48.10, 4.92∠171.93, 3.24∠54.40
- 14.76∠171.93, 9.73∠54.40, 13.41∠-48.10
- 13.41∠-48.10, 14.76∠171.93, 9.73∠54.40

No, the answer is incorrect.
Score: 0

Accepted Answers:
13.41∠-48.10, 14.76∠171.93, 9.73∠54.40

5) The relation between voltage transformation ratio a_t (HV to LV) and actual winding turn-ratio (n_t) of a **2 points** grounded-wye/delta step-down transformer connection is

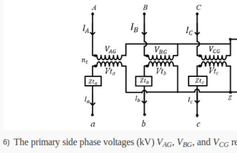
- $n_t = 3a_t$
- $n_t = \sqrt{3}\, a_t$
- $n_t = a_t$
- $n_t = a_t/\sqrt{3}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$n_t = a_t/\sqrt{3}$

Data for the Q.6, Q.7 and Q.8: The 7200/415 V grounded wye / grounded wye transformer is shown in the following figure. The primary side line-to-line voltages are

V_{AB} = 6.67 ∠−2.50° kV, V_{BC} = 6.86∠−116.50° kV, and V_{CA} = 7.37∠ 119.26° kV.



6) The primary side phase voltages (kV) V_{AG}, V_{BG}, and V_{CG} respectively are **4 points**

- 2.36∠-34.48, 3.63∠-147.67, 3.68∠93.21
- 3.08∠-33.21, 3.89∠-148.97, 4.03∠92.46
- 4.09∠-33.21, 3.78∠-148.97, 4.19∠92.46
- 5.44∠-34.48, 3.37∠-147.67, 3.47∠93.21

No, the answer is incorrect.
Score: 0

Accepted Answers:
4.09∠-33.21, 3.78∠-148.97, 4.19∠92.46

7) The secondary side phase voltages (kV) V_{ag}, V_{bg}, and V_{cg} respectively are **2 points**

- 0.236∠-33.21, 0.218∠-148.97, 0.241∠92.46
- 0.321∠-33.21, 0.268∠-148.97, 0.299∠92.46
- 0.344∠-34.48, 0.256∠-147.67, 0.278∠93.21
- 0.356∠-34.48, 0.219∠-147.67, 0.225∠93.21

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.236∠-33.21, 0.218∠-148.97, 0.241∠92.46

8) The secondary side no load line voltages (kV) V_{ab}, V_{bc}, and V_{ca} respectively are **2 points**

- 0.445∠-2.50, 0.301∠-116.50, 0.482∠119.26
- 0.234∠-2.50, 0.325∠-116.50, 0.495∠119.26
- 0.518∠-2.50, 0.345∠-116.50, 0.301∠119.26
- 0.385∠-2.50, 0.395∠-116.50, 0.425∠119.26

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.385∠-2.50, 0.395∠-116.50, 0.425∠119.26

9) The three single-phase transformers of the following ratings are connected as ungrounded-wye/delta. **4 points**
Transformer rating: 100 kVA, 11 kV/415 V. The a_t parameter matrix of the connection is

- $a_t = \begin{bmatrix} 30 & -30 & 0 \\ 0 & 30 & -30 \\ -30 & 0 & 30 \end{bmatrix}$
- $a_t = \begin{bmatrix} 11.54 & 5.77 & 0 \\ 0 & 11.54 & 5.77 \\ 5.77 & 0 & 11.54 \end{bmatrix}$
- $a_t = \begin{bmatrix} 20 & 10 & 0 \\ 0 & 20 & 10 \\ 10 & 0 & 20 \end{bmatrix}$
- $a_t = \begin{bmatrix} 15.3 & -15.3 & 0 \\ 0 & 15.3 & -15.3 \\ -15.3 & 0 & 15.3 \end{bmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$a_t = \begin{bmatrix} 15.3 & -15.3 & 0 \\ 0 & 15.3 & -15.3 \\ -15.3 & 0 & 15.3 \end{bmatrix}$

10)The equivalent line impedance from the regulator to the load center is (0.25 + *j* 0.75) Ω. The *R* and *X* **2 points**
setting of the compensator are (0.50 + *j*1.5) Ω. If the rating of the CT is 600/5 A, the rating of PT is

- 6400/120 V
- 4200/120 V
- 7200/120 V
- 3900/120 V

No, the answer is incorrect.
Score: 0

Accepted Answers:
7200/120 V

11)If the tap position of the standard single-phase B-Type regulator is at +13, the ***a***, ***b***, ***c***, and ***d*** **2 points**
parameters of the regulator are

- a = 1.04, b = 0, c = 0, d = 0.97
- a = 0.92, b = 0, c = 0, d = 1.08
- a = 0.97, b = 0, c = 0, d = 1.04
- a = 1.08, b = 0, c = 0, d = 0.92

No, the answer is incorrect.
Score: 0

Accepted Answers:
a = 0.92, b = 0, c = 0, d = 1.08