Continuing Education Course #357
Transformers
What Every Engineer Should Know

1. Referring to Figure 1 in the text, the turns ratio of a transformer is given by $a = N_S / N_P$.
- a. true
- b. false

2. In an ideal transformer power in = power out + losses, where losses are considered.
- a. true
- b. false

3. The efficiency of a transformer is given by 1- (losses/ power in). Hint: this is an algebra problem!
- a. true
- b. false

4. The power factor of a transformer is given by cos θ = watts / VA
- a. true
- b. false

5. K-Factor transformers
- a. are designed to operate with non linear loads
- b. have oversize windings and better ventilation to dissipate heat
- c. have electrostatic shields to attenuate noise
- d. all of the above

6. A three phase transformer has ONLY one flux path.
- a. true
- b. false

7. A phase displacement given by Dd10 is a delta to delta with a 60° lead.
- a. true
- b. false

8. Transformer regulation measures performance under load.
- a. true
- b. false

9. Referring to figure 2 in the text, if $a = 4$, $VP = 460v$ and $i_s = 10$amps, what is $VS$?
- a. 266 v
- b. 115 v
- c. 1840 v
- d. none of the above

10. Referring to figure 2 in the text, if $a = 4$, $VP = 460v$ and $iS = 10$amps, what is $iP$?

- a. 4.3 amps
- b. 40 amps
- c. 2.5 amps
- d. none of the above

11. In a three phase transformer with a delta primary, the line amps = phase amps x 1.73.

- a. true
- b. false

12. In a three phase delta to delta transformer, if $VP = 600v$ and $VS = 120v$ and $iP$ is operating at 5 amps, what is the turns ratio?

- a. 3
- b. 4
- c. 5
- d. None of the above

13. Continuing the problem from above, what is the value of $iS$?

- a. 1 amp
- b. 4 amps
- c. 5 amps
- d. none of the above

14. Continuing the problem from question above, what is the operating KVA of the transformer? Hint: remember this is 3 phase!

- a. 3 KVA
- b. 9 KVA
- c. 5.2 KVA
- d. none of the above

15. NEMA temperature code "A" represents a temperature rise of_____?

- a. 55°C
- b. 80°C
- c. 115°C
- d. 150°C