P.E.

ELECTRICAL & COMPUTER: POWER

PRACTICE EXAM SAMPLE
MORNING SESSION

QUESTIONS 1-40
4 HOUR TIME LIMIT
When engineers model a real transformer using an equivalent circuit diagram, the losses due to flux escaping from the core are represented as what type of circuit elements?

A. Resistors  
B. Inductors  
C. Capacitors  
D. Diodes

Calculate the percent voltage drop from the bus to load B.

A. 3.52%  
B. 3.71%  
C. 7.25%  
D. 7.41%

According to the NEC®, what is the minimum required length for the straight-pull junction box depicted below:

A. 12”  
B. 24”  
C. 32”  
D. 48”
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When engineers model a real transformer using an equivalent circuit diagram, the losses due to flux escaping from the core are represented as what type of circuit elements?

A. Resistors  
B. Inductors  
C. Capacitors  
D. Diodes

Calculate the percent voltage drop from the bus to load B.

215'  
71\(\angle 15^\circ\) A

A. 3.52%  
B. 3.71%  
C. 7.25%  
D. 7.41%

According to the NEC®, what is the minimum required length for the straight-pull junction box depicted below:

A. 12”  
B. 24”  
C. 32”  
D. 48”
This is a 3-phase voltage drop problem. Use the given impedances to calculate the total line impedance. Then use those values along with the line current to calculate the voltage drop. Since complex numbers are given in the problem, use the handy formula for voltage drop magnitude for the calculation. The answer is (A), see below:

\[
|V_d| = \sqrt{ \left( \frac{R}{1000} \ell \cos \theta \right)^2 + \left( \frac{X}{1000} \ell \sin \theta \right)^2 }
\]

\[
|V_d| = \sqrt{ \left( \frac{0.51}{1000} \times 215 \cos 15 \, \text{A} \right)^2 + \left( \frac{0.048}{1000} \times 215 \sin 15 \, \text{A} \right)^2 } = 7.33 \, \text{V}
\]

\[
\frac{V_d}{V} \times 100 = 3.52\%
\]

For straight-pull junction boxes, the NEC® requires the length to be eight times that of the largest conduit; look up NEC® 314.28(A)(1). The largest conduit in this problem is the 4" conduit. So the answer is 32". (C) is the correct answer.
This concludes the sample preview of Complex Imaginary’s P.E. Power practice exams.
Like most major professional licensing tests, the P.E. Licence Electrical and Computer-Power (a.k.a. Power P.E. Exam) requires intellectual knowledge of the subject matter as well as a robust ability to sustain critical thought over an extended period of time. The exam covers many technical aspects of electrical engineering - and does so over a single, eight-hour testing day. The questioning for these technical aspects is timed and must be completed promptly. Not having the time to answer is most commonly the product of unfamiliarity with the question’s subject matter, ignorance of source and reference material, and simple, honest waning of attention span. Even an engineer with thorough knowledge of the subject matter can fatigue and ultimately miss significant sections of the test purely because of a lack of extended practice. These practice tests drill the test-taker on the subject matter and technical knowledge needed for a successful exam. And they give the test-taker the opportunity to mentally train for the extended testing session that the exam will put them through. Using these practice tests will give the student the ability to practice, practice, practice: getting the information down cold. The appropriate use of these test will give solid knowledge and ability for answering the questions on the official NCEES* exam.

Now every Power P.E. candidate has the opportunity to study effectively and efficiently for the P.E. exam. No more information without application. No more lost hours of study on subject matter divorced from practice on an exam. No more frustration over the study material’s dubious usefulness for the actual exam. And, hopefully, no more exam failures.

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