CHAPTER 3

116.

H = I/2πr = 50/0.2π = 79.6A/m

ANSWER (C)

516.

The path length for Leg B is *d,* and the path length for Leg C is *3d.* Thus, the flux will divide between Legs Band C in the ratio of 1:3. Therefore, 1/4 of the total flux will be in Leg C and *3/4* will be in Leg B.

Φ_{PC}= 1/4 x 3.0 x 10-3= 0.75 x 10-3Wb

ANSWER (B)

CHAPTER 4

133.

$$V_{sec} = I_{line}\left(\frac{0.78+j0.052}{1{,}000\text{ ft}}\right)(200\text{ ft}) + V_{load} + I_{line}\left(\frac{0.78+j0.052}{1{,}000\text{ ft}}\right)(200\text{ ft})$$

$$= 240\angle 0° + (2)(30\angle 0°)\left(\frac{1}{5}\right)(0.78+j0.052)$$

$$= 249.4\angle 0.143°\text{ V}$$

$$|V_{sec}| = 249.4\text{ V}$$

ANSWER (B)

135.

Pload = 8,000 kW

P .F. = 0.80

SZoad= 8,000kW / 0.80 = 10,000kVA

QZoad= √1 $0{,}000^2$ - $8{,}000^2$ = 6,000 kvar .

Snew= 8,000kW /0.95 = 8421kVA

Qnew= √$8{,}421^2$ - $8{,}000^2$ = 2,630 kvar

Qcap= QZoad- Qnew= 6,000 - 2,630 = 3,370kvar

ANSWER (B)

508.

For this unbalanced load, *IA*+ *IB*+ *IN*= 0

$$\text{Also, } V_{\phi N} = V_{\phi\phi}/\sqrt{3} = 13.2/1.732 = 7.62\text{ kV}$$

$$|I_A + I_B| = |-I_N| = \left|\frac{200+j100}{7.62\angle 0°} + \frac{200+j100}{7.62\angle 120°}\right| = 29.3\text{ A}$$

ANSWER (D)

509.
The system is initially ungrounded (the utility neutral is disconnected from ground). Connecting Corner A of the delta to ground will therefore have no effect on the relative phase voltages and *VBG*= *VBA*= 13.2 kV.
ANSWER (C)

510.
Ic = 500 kVA/13.2 kV = 37.9 A
ANSWER (C)

511.
The system is balanced.

$$V_{an} = \frac{12.5}{\sqrt{3}} \angle -30^\circ + \frac{70 \angle -20^\circ}{1{,}000}(5 + j10) = 7.48 \angle -24.2^\circ$$

$$|V_{ab}| = 7.48\sqrt{3} = 12.95 \text{ kV}$$

ANSWER (C)

CHAPTER 5

123.
The power input to the speaker is *V2/R= (30)2/8= 900/8* = 112.5 W. The speaker output is (112.5 W)(0.15) = 17 W.
ANSWER (B)