Errata for Electric Machinery Fundamentals 5/e

(Current at 26 August 2011)

Please note that some or all of the following errata will be corrected in future reprints of the book, so they may not appear in your copy of the text. PDF pages with these corrections are attached to this appendix; please provide them to your students.

1. Page 145, Problem 2-3, was printed incorrectly in the first printing of this text. By accident a portion of Problem 2-4 was printed instead of the appropriate text. The correct text is:

> **2-3.** Consider a simple power system consisting of an ideal voltage source, an ideal step-up transformer, a transmission line, an ideal step-down transformer, and a load. The voltage of the source is $\mathbf{V}_S = 480\angle 0°\ \mathrm{V}$. The impedance of the transmission line is $Z_{\text{line}} = 3 + j4\ \Omega$, and the impedance of the load is $Z_{\text{load}} = 30 + j40\ \Omega$.
>
> *(a)* Assume that the transformers are not present in the circuit. What is the load voltage and efficiency of the system?
>
> *(b)* Assume that transformer 1 is a 1:5 step-up transformer, and transformer 2 is a 5:1 step-down transformer. What is the load voltage and efficiency of the system?
>
> *(c)* What transformer turns ratio would be required to reduce the transmission line losses to 1% of the total power produced by the generator?

2. Page 147, Problem 2-13, the transformer is Y-Δ connected.

3. Page 264, Problem 4-6, the generator should be "**2-pole, Δ-connected, 60 Hz**" instead of "Y-connected".

4. Page 267, the paragraph before Problem 4-16 should say "Problems 4-16 to 4-26 refer to a six-pole Y-connected synchronous generator rated at **500 kVA**, 3.2 kV, 0.9 PF lagging, and 60 Hz. Its armature resistance R_A is 0.7 Ω."

5. Page 269, Problem 4-25, the problem should say "Make a plot of the terminal voltage versus the load **impedance angle**" instead of "Make a plot of the terminal voltage versus the load power factor".

6. Page 301, Problem 5-4, the synchronous reactance should be 2.5 Ω.

7. Page 304, Problem 5-12, parts *(b)* and *(i)* are incorrect. The correct problem is given below, with the changes in red.

> **5-12.** Figure P5-3 shows a small industrial plant supplied by an external 480 V three-phase power supply. The plant includes three main loads as shown in the figure. Answer the following questions about the plant. The synchronous motor is rated at 100 hp, 460 V, and 0.8-PF-leading. The synchronous reactance is 1.1 pu and armature resistance is 0.01 pu. The OCC for this motor is shown in Figure P5-4.
>
> *(a)* If the switch on the synchronous motor is open, how much real, reactive, and apparent power is being supplied to the plant? What is the current I_L in the

transmission line?

The switch is now closed and the synchronous motor is supplying rated power at rated power factor.

(b) **What is the field current in the motor?**

(c) What is the torque angle of the motor?

(c) What is the power factor of the motor?

(d) How much real, reactive, and apparent power is being supplied to the plant now? What is the current I_L in the transmission line?

Now suppose that the field current is increased to 3.0 A.

(e) What is the real and reactive power supplied to the motor?

(f) What is the torque angle of the motor?

(g) What is the power factor of the motor?

(h) How much real, reactive, and apparent power is being supplied to the plant now? What is the current I_L in the transmission line?

(i) **How does the line current in part *(d)* compare to the line current in part *(h)*? Why?**

8. Page 305, Problem 5-17, the power supplied by the generator is 80 kW.

9. Page 358, Figure 6-34, one of the numbers in the table of NEMA starting code letters are incorrect. The correct table is given below, with the corrected error in red.

Nominal code letter	Locked rotor kVA/hp	Nominal code letter	Locked rotor kVA/hp
A	0-3.15	L	9.00-10.00
B	3.15-3.55	M	10.00-**11.20**
C	3.55-4.00	N	11.20-12.50
D	4.00-4.50	P	12.50-14.00
E	4.50-5.00	R	14.00-16.00
F	5.00-5.60	S	16.00-18.00
G	5.60-6.30	T	18.00-20.00
H	6.30-7.10	U	20.00-22.40
J	7.10-8.00	V	22.40-up
K	8.00-9.00		

10. Page 400, Problem 6-23, the motor develops its full-load induced torque at 3.5 percent slip.

11. Page 402, Problem 6-31, this problem refers to the motor of Problem 6-21, not the motor of problem 6-23.

12. Page 402, Problem 6-32, the parameters of the outer bar are

    $R_{2o} = 4.80\ \Omega$ $\qquad X_{2o} = 3.75\ \Omega$

    and the parameters of the inner bar are

    $R_{2i} = 0.573\ \Omega$ $\qquad X_{2i} = 4.65\ \Omega$

13. Page 553, Problem 8-4, the armature reaction is $1000\ \mathrm{A \bullet turns}$ at full load.

14. Page 556, Problem 8-13, should say: "A **7.5**-hp 120-V series dc motor has an armature resistance of 0.1 Ω and a series field resistance of 0.08 Ω. At full load, the current input is **56** A, and the rated speed is 1050 r/min. Its magnetization curve is shown in Figure P8-5. The core losses are **220** W, and the mechanical losses are **230** W at full load."

15. Page 556, Problem 8-13 *(b)*, should say: "What are the speed and efficiency of the motor if it is operating at an armature current of **40** A?"

16. Page 667, Problem C-1, this problem should begin with the sentence: "A **13.8-kV, 50-MVA, 0.9-power-factor-lagging,** 60-Hz, four-pole Y-connected synchronous generator has a direct-axis reactance of **2.5 Ω**, a quadrature-axis reactance of **1.8 Ω**, and an armature resistance of **0.2 Ω**.".