ERRATA for

FE Electrical and Computer Practice Exam

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Revisions are shown in red.

Question 3, p. 8

Consider two sets, A and B, where Set A has four elements and Set B has five elements. A function $f(x)$ that maps Set A to Set B, where each element of A is mapped to a unique element of B, is:

- ○ A. injective
- ○ B. surjective
- ○ C. bijective
- ○ D. the inverse of the function mapping B to A

Question 26, p. 17

At 80°F the contact potential for a given p-n junction is 0.026 V. If the temperature is raised to 180°F, and no other variables in the equation change, the increase (mV) in the contact potential will be _____.

Question 27, p. 17

A section of copper has resistivity of 10 Ω·m at 20°C. The temperature coefficient of copper is 0.004041°C^{-1}. If the temperature is increased to 30°C, the resistivity (Ω·m) is most nearly:

- ○ A. 8.96
- ○ B. 10.40
- ○ C. 11.04
- ○ D. 11.20

Solution Table, p. 62

Number 3 in the table should be A.

Solution 3, p. 63

The definitions of injective, surjective, and bijective functions are given in the Discrete Math section in the Mathematics chapter of the *FE Reference Handbook*.

Since no element of B is a function of more than a single element of A, there is a one-to-one (i.e., injective) relationship from A to B. $f(x)$ cannot be surjective since at least one element of B does not map from any element of A. Since it cannot be surjective, it is, by definition, not bijective. In order for a function to have an inverse, it must be bijective.

THE CORRECT ANSWERS IS: A

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Solution 26, p. 72

Additional information was added to the solution:

For every degree Celsius rise in temperature, the forward voltage decreases approximately 2mV for silicon diodes (*p-n* junction). This is because the intrinsic carrier concentration in the semiconductor material increases with temperature, reducing the potential barrier of the *p-n* junction.

Solution 27, p. 73

From the Resistivity section in the Electrical and Computer Engineering chapter of the *FE Reference Handbook*, there is a linear relationship between resistivity and temperature for metals such as copper according to the following relationship:

$$\rho = \rho_0 [1 + \alpha(T - T_0)]$$

where α is the temperature coefficient of resistivity per degree, ρ_o is the resistivity at T_0, T is for temperature in °C, and ρ is the resistivity of the material.

$$\rho = 10[1 + 0.004041(30 - 20)]$$
$$= 10.40\ \Omega\text{-m}$$

THE CORRECT ANSWER IS: B