

CHAPTER 1 SOLUTIONS

Answers reported to 2-3 significant digits.

1.1

$$a) \quad 10 \frac{lb_m \cdot ft}{s^2} \left(\frac{s^2 \cdot lb_f}{32.174 lb_m \cdot ft} \right) = 0.31 lb_f$$

$$10 \frac{lb_m \cdot ft}{s^2} \left(\frac{1 kg}{2.20462 lb_m} \right) \left(\frac{12 in}{1 ft} \right) \left(\frac{2.54 cm}{1 in} \right) \left(\frac{1000 g}{1 kg} \right) = 1.4 \times 10^3 \frac{g \cdot cm}{s^2} = 1.4 \times 10^3 \text{ dyne}$$

$$b) \quad 204 Pa \left(\frac{1000 Pa}{1 kPa} \right) \left(\frac{1 atm}{1.01325 \times 10^5 Pa} \right) = 0.20 atm$$

$$204 Pa \left(\frac{14.696 \frac{lb_f}{in^2}}{101.325 kPa} \right) = 2.9 \frac{lb_f}{in^2}$$

$$c) \quad T(^{\circ}F) = 1.8T(^{\circ}C) + 32$$

$$70^{\circ}F = 1.8T(^{\circ}C) + 32$$

$$T(^{\circ}C) = 21^{\circ}C$$

$$T(^{\circ}F) = 1.8T(K) - 459.67$$

$$70^{\circ}F = 1.8T(K) - 459.67$$

$$T(K) = 294 K$$

$$d) \quad 100 \frac{in^2 \cdot lb_m}{s^2} \left(\frac{1 kg}{2.20462 lb_m} \right) \left(\frac{2.54 cm}{1 in} \right)^2 \left(\frac{1 m}{100 cm} \right)^2 = 0.029 \frac{kg \cdot m^2}{s^2}$$

$$\frac{kg \cdot m^2}{s^2} = N \cdot m = J$$

$$0.029 \frac{kg \cdot m^2}{s^2} = 0.029 J$$

$$0.029 J \left(\frac{0.239006 cal}{1 J} \right) = 0.0070 cal$$

$$e) \quad m = 150 lb_m$$

$$W = mg = 150 lb_m \left(32.174 \frac{ft}{s^2} \right) \left(\frac{s^2 \cdot lb_f}{32.174 lb_m \cdot ft} \right) = 150 lb_f$$

Bioengineering Fundamentals Solution Manual

R. Praveen Kumar, B. Bharathiraja



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Solution's Manual - Basic Transport Phenomena in Biomedical Engineering Taylor & Francis Group,2012-01-15

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Fundamentals of Systems Analysis Jerry FitzGerald,Ardra F. FitzGerald,1973 **Books in Series** ,1979 *Books in Print* ,1981 'American Book Publishing Record' Cumulative R. R. Bowker LLC,1978 **Courses Catalog - University of Illinois at Urbana-Champaign** University of Illinois at Urbana-Champaign,2002 Includes undergraduate and graduate courses *Peterson's Annual Guides to Graduate Study* ,1982-12

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