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Due: Thursday, February 15, 2001 Section: _____

Questions for Chapters 3 & 4. Be sure to show your work and to label your units.

Chapter 3

1. Express the following in scientific notation:

a. 6950 = _____ b. 0.00059 = _____

2. Solve each of the following:

a. $(5^4)^2$ = _____ b. $3^2 + 3^5$ = _____

c. 0.004^2 = _____

3. Solve the following:

a. $\log_3 25$ = _____ b. $\log_2 10$ = _____

4. Assume base 10 for the following problems:

a. log 1000 = _____ b. log 0.5 = _____

c. antilog 1.825 = _____ d. antilog 3.75 = _____

Chapter 4

Recall the two-step procedure for solving the decibel problems: (1) Select the proper equation, and (2) form a ratio and solve the problem.

1. Convert each of the following intensity ratios to decibels.

a. 1:1 b. 10:1

c. 100:1 d. 3:1

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e. 1:10

f. 1:3

2. Convert each of the following decibels to intensity ratios.

a. 0

b. 30

c. 6

d. 56

3. Calculate dB IL re: 10^{-12} watt/m^2 for each of the following values of sound intensity (I_x).

a. 10^{-12}

b. 10^{-8}

4. Calculate sound intensity (I_x) in watt/m^2 for each of the following values of dB IL re: 10-12 watt/m^2.

a. 20

b. 13

5. Convert each of the following pressure ratios to decibels.

a. 1:1

b. 10:1

c. 100:1

d. 3:1

e. 1:10

f. 1:3

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6. Convert each of the following decibels to pressure ratios.

a. 0 b. 30

c. 6 d. 56

7. Calculate dB SPL re: 2×10^{1} μPa for each of the following values of sound pressure (p_x) in μPa.

a. 2×10^{1} b. 2×10^{2}

c. 4×10^{3} d. 1.05×10^{6}

8. Calculate sound pressure (p_x) in μPa for each of the following values of dB SPL re: 2×10^{1} μPa.

a. 0 b. 12

c. 30

9. Calculate dB SPL re: 2×10^{-4} dyne/cm^2 for each of the following values of sound pressure (p_x) in dyne/cm^2.

a. 0.0002 b. 0.002

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10. Calculate the total intensity in watt/m2 that results from combining the following intensities from uncorrelated sources.

a. 10^{-8} + 10-8

b. $10^{-6} + 10^{-6}$

c. $(2 \text{ X } 10^{-6}) + 10^{-6}$

11. Calculate the sound pressure level that results from combining the following uncorrelated sound sources whose levels are given in dB SPL.

a. 20 + 20

b. 30 + 30

c. 46.2 + 46.2

d. 20 + 20 + 20

e. 60 + 70

f. 60 + 70 + 80