Quiz – Mathematics Concepts

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Course: *BUS 302*
Title: *The Gateway Experience* (3 units)

"You cannot manage what you cannot measure." (paraphrase)
--Peter Drucker (1909-2005)

Write your name, team number, and class time in the upper-right hand corner on the front page of this sheet. Answer all questions on this sheet. You must use a blue or black pen only. You must write neatly. ***No*** external calculation devices of any kind are to be used including, but not limited to, computers or calculators. (Some of these questions are original with the instructor, some originated with the GMAT Quantitative Review book, and some are drawn from the final exam in the CSUN Business Calculus course (MATH 103).

Performance Measurement:
Each question is measured on a six point scale. The scoring rubric for each question on this exam is as follows:

6	-	correct
4	-	mostly correct
2	-	mostly incorrect
0	-	incorrect

Mathematics
Please answer each part of each question.

1. Assume that hospital inpatient services for July, 2006 was $50. Further, assume that hospital inpatient services for August, 2006 was $100. Part a. What is the general formula to calculate the percent change for a value over two different time periods? Part b. Expressed as a percentage, what is the percent change in hospital inpatient services from July, 2006 to August, 2006?

2. Assume that the defect rate for a manufactured piece of ovenware is ¼ of 1%. Part a. Express ¼ of 1% as a decimal. Part b. Express ¼ of 1% as a fraction.

3. Part a. Express the decimal number 5,000 in scientific notation. Part b. Express 7.53226E-3 in decimal notation.

4. Part a. If *a* is a positive whole number, which is greater: $a/5$ or $a/8$? Part b. How do you know?

5. Circle the numbers that are equivalent to 0.03—3%, 0.030, $3/10$, 0.30%, $30/1000$, 0.30, $3/1000$

6. The general formula for the future value of a lump sum is as follows:

$$FV = PV \bullet (1+i)^t$$

Where:
FV = future value
PV = present value
i = interest rate
t = time (number of periods)

Derive the formula for PV (present value) algebraically. Show your work.

7. Part a. 8 is 2% of what number? Part b. What percent of 18 is 12? Part c. What percent of 14 is 21?

8. Part a. What is $\frac{1}{8}+\frac{1}{2}$? Part b. What is $\frac{1}{8}\times\frac{1}{2}$? Part c. What is $\frac{1}{8}\div\frac{1}{2}$?

9. Part a. What is the least common multiple of 6 and 9? Part b. What is the greatest common factor of 6 and 9?

10. How many CDs would a recording company have to make and sell to break even if the fixed costs are $18,000, the variable costs are $4.50 per CD, and CDs are sold to retailers for $13.50? Show all of your work.

11. The price of a certain television set is discounted by 10 percent, and the reduced price is then discounted by 10 percent. This series of successive discounts is equivalent to a single discount of _____ percent. Show your work.

12. In Country X a returning tourist may import goods with a total value of $500 or less tax free, but must pay an 8 percent tax on the portion of the total value in excess of $500. What tax must be paid by a returning tourist who imports goods with a total value of $730?

13. A certain manufacturer produces items for which the production costs consist of annual fixed costs totaling $130,000 and variable costs averaging $8 per item. If the manufacturer's selling price per item is $15, how many items must the manufacturer produce and sell to earn an annual profit of $150,000? Show your work.

14. If the number n of calculators sold per week varies with the price p in dollars according to the equation $n=300-20p$, what would be the total weekly revenue from the sale of $10 calculators? Show your work.

15. Last year if 97 percent of the revenues of a company came from domestic sources, and the remaining revenues, totaling $450,000, came from foreign sources, what was the total of the company's revenues? Show your work.

16. As a salesperson, Phyllis can choose one of two methods of annual payment: either an annual salary of $35,000 with no commission or an annual salary of

$10,000 plus a 20 percent commission on her total annual sales. What must her total annual sales be to give her the same annual pay with either method? Show your work.

17. Assume the revenue function for a product in a firm is given by the following function:

$$R = -0.05p^2 + .98p + 18$$

Where:
R = revenue
p = price of product (in thousands of dollars)

What is the price at which marginal revenue is maximized? (hint: take the first derivative and solve for *p*).