GSCI 1000 Quiz 1 Name: _____

Instructor: Craig MacKinnon

September 25, 2012 Student ID number: _____

NOTE: THERE WERE DIFFERENT VERSIONS OF THE QUIZ, BUT THEY HAD THE SAME QUESTIONS (just in a different order)

1. 7×10^4 is equal to

   (a) 70000

2. Perform the following addition: $(3.15 \times 10^{-1}) + (9.4 \times 10^{-2})$

   This is 0.315 + 0.094, which equals

   (c) 4.09×10^{-1}

3. If two events A and B always occur together,

   (b) there is a *correlation* between A and B

4. Which of the following is the best description of science?

   (d) a method by which knowledge and information is gathered

5. Length is measured in metres (m), currently defined as the distance light travels in $(299\ 792\ 458)^{-1}$ seconds. The unit m is,

   (a) a base S.I. unit

6. The prefix n (for "nano") is,

   (c) 10^{-9}

7. What is absolute zero in temperature?

   (d) 0 K (Kelvin)

8. The normal number of chromosomes in humans is 46. In an experiment, ten Down's syndrome patients have been tested and they have an additional copy of chromosome 21 (for 47 total chromosomes). Billy is genetically tested as an infant and has an extra copy of chromosome 21.

   "Therefore, Billy will develop Down's syndrome."

   This is an example of,

   (f) inductive reasoning

(not "deductive" - we haven't made the hypothesis that all Down's Syndrome patients have 47 chromosomes)

9. Is “the moon is made of green cheese” a valid scientific theory, as defined by the Popper model? Explain.

Yes - it is a testable hypothesis, and could lead to an observation that invalidates the theory, *i.e.* we can go to the moon and test if it is, in fact, made of green cheese.

10. An space alien lands and sneaks into a maternity ward waiting room. There it observes many people: all the women are pregnant, and all the men aren't. The alien formulates the theory “all female humans are pregnant.” It is then told a female (human) nurse will enter the room. Which statement is a valid example of *deductive* reasoning (based on its theory)?

(a) the nurse will be pregnant

The alien used the scientific method to make his deduction in question 6. Fill in the blanks based on what the alien did in each step of the scientific method: (note, this was worth 2 points)

Step 1: Observation — the females in the waiting room are pregnant, the males are not

Step 2: Hypothesis — all female humans are pregnant

Step 3: Prediction — the next female (the nurse) I see will be pregnant

Step 4: Experiment — observe the nurse - is she pregnant or not

Step 5: What's next for the alien? — Depends on whether the nurse is pregnant or not. If so, the alien has confirmed his hypothesis and should move on to a new set of experiments (*e.g.* outside the hospital). If nurse is not pregnant, alien will have to formulate a new hypothesis.

All questions worth 1 point except this last one, worth 2 points. Multiple choice are 1 or 0, the explanation questions could be awarded part marks.