ISP213H Midterm
40 points = 10 (Sherlock Holmes) + 30 short answer
28 February 2007 – due in class 14 March 2007

NAME: ___________________________ Student Number: _______________________

Short answer: few words, legible (!) phrases are fine
If you need more space (!!), you can use the back… Be smart. Be cool.

Page 2: _________ out of 6  Page 3: _________ out of 4

Page 4: _________ out of 6  Page 5: _________ out of 6

Page 6: _________ out of 4  Page 7: _________ out of 4

Sherlock: _________ out of 10 TOTAL _________ out of 40
1. 2 points. Karl Popper turned the program of the logical empiricists on its head: to what does this refer?

2. 2 points. What is Galilean Relativity?

3. 2 points. What is Empiricism? Who is an example of an Empiricist?
4. 2 points What is Rationalism? Who is an example of a Rationalist?

5. 2 points. How did Aristotle reconcile the competing philosophies of Change and Permanence in his cosmology?
6. 2 points. In a few lines: what was Plato’s theory of Forms and how might Galileo’s approach to physics be called “Platonic”? (It has sometimes been characterized as such.)

7. 2 points. What was the most important prediction of Copernicus’ model which was confirmed by Galileo?

8. 2 points. Galileo had an idea of inertia…what was the reasoning that he did that gave him that idea?
9. 2 points. Name four things that Galileo discovered or measured from his telescope observations.

10. 2 points. Draw an example of a planet circling the Earth on an epicycle according to Ptolemy.

11. 2 points. What is meant by the Theory-ladenness of scientific observation?
12. 2 points. In Galileo’s rash public Letter to the Grand Duchess Christina, he states: “Now, if truly demonstrated physical conclusions need not be subordinated to biblical passages, but the latter must rather be shown not to interfere with the former, then before a physical proposition is condemned it must be shown to not be rigorously demonstrated – and this is to be done not by those who hold the proposition to be true, but by those who judge it to be false.” What was the importance of this declaration?

13. 2 points. The diagram shows the trajectory of a projectile. At point A (the top) draw the horizontal and vertical components of overall (vector) velocity. At point B, do the same thing, and likewise at point C, an instant before it hits. Be mindful of the relative size of the vectors among the three locations.
14. 2 points. Imagine a bomber releasing a bomb as below. At position A, the bomb is attached, in B, it is just released. In position C, the airplane has continued on its way after dropping the bomb. Draw in where the bomb might be at position C according to both Galileo (mark a G) and according to Aristotle (mark an A).

![Diagram of bomb release]

15. 2 points. With a picture, illustrate Kepler’s Area Law for planets. Indicate the position of the sun and show on your picture where the planet is going fastest.