ISP213H Midterm
40 points = 10 (Sherlock Holmes) + 30 short answer

27 February 2008 – due in class 12 March 2008

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

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Page 4: _____ out of 6

Page 5: _____ out of 6

Page 6: _____ out of 5

Sherlock: _____ out of 10

TOTAL _____ out of 40

1. 2 points. In a few lines: what was Plato's theory of Forms and how might Galileo's approach to physics be called "Platonic"?

2. 2 points. How does natural motion for Aristotle differ for entities inside the orbit of the moon and outside of the orbit of the moon? Give examples of each.

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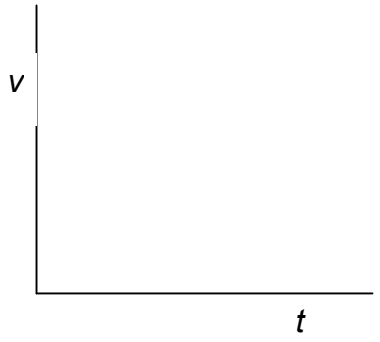
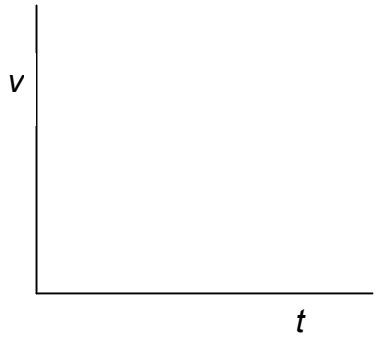
3. 2 points. On the left, make sketch of velocity vs time for "uniformly difform motion" and on the right, a sketch of uniform motion. When would the distance traveled for each be the same? This was the Merton Mean Speed Theorem.





4. 2 points. Galileo had an idea of inertia…what was the reasoning that he did that gave him that idea?

5. 3 points. Name three things that Galileo discovered from his telescope observations.

6. 2 points. What is Scientific Realism?

7. 2 points. Karl Popper turned the program of the logical empiricists on its head: to what does this refer?

8. 2 points. What is meant by the Theory-ladenness of scientific observation?

9. 2 points. Describe the cosmology of Pythagoras.

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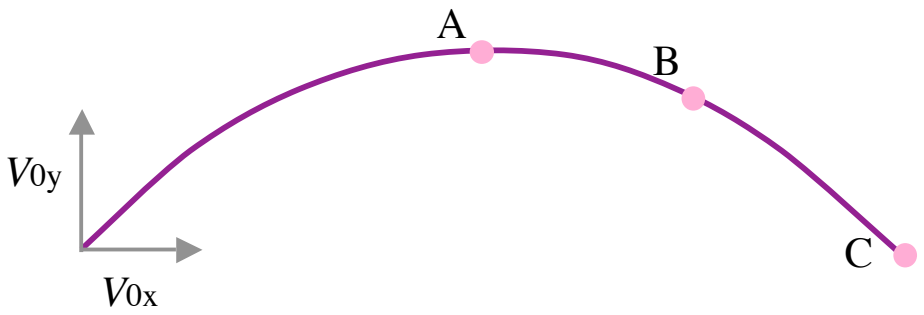
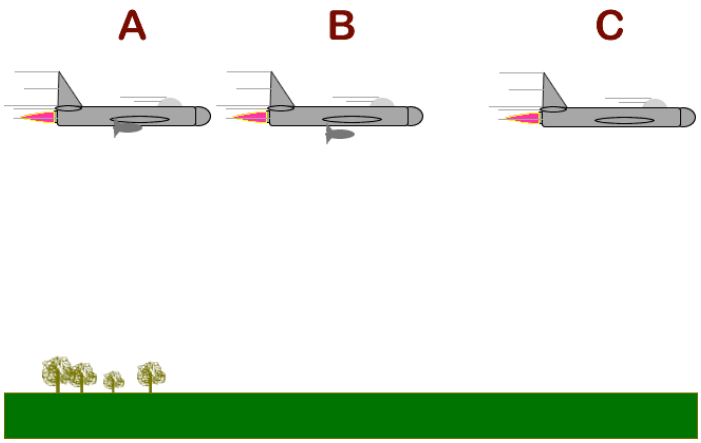
10. 3 points. In Galileo's rash public Letter to the Grand Duchess Christina, he states: "Now, if truly demonstrated physical conclusions need not be subordinated to biblical passages, but the latter must rather be shown not to interfere with the former, then before a physical proposition is condemned 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?

11. 3 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.



12. 2 points. Imagine a bomber releasing a bomb as below. At position A, the bomb is attached, in B, it is just released. Draw in where the bomb might be at position C according to both Galileo (**mark a G**) and according to Aristotle (**mark an A**).



13. 3 points. Describe in a picture and words the inclined plane experiment that Galileo did (3pts) and how it was possible for him from those results to determine the relationship between distance traveled and time elapsed for constantly accelerated motion (3pts). Be quantitative, in the sense of assume that a clock ticks in integer time units and that distance units are quantified in integers.