University of Toronto
Faculty of Arts and Sciences

HPS210H1F– Scientific Revolutions I

Final Examination
December 2017
Duration: 2 hours

Please read all questions carefully.
Write all answers in the exam booklet.
No aids permitted.
Good luck.

THIS SHEET WILL NOT BE GRADED

Section One: Multiple Choice – pick one option that best answers the question and record it IN THE EXAM BOOKLET – 2 points each (20 in total)

1) With his telescope, Galileo

a) improved on Ptolemy's telescopic observations
b) observed the phases of Venus
c) found clear evidence of stellar parallax
d) discovered four moons of Jupiter
e) all of the above
f) b and d

2) Andreas Vesalius

a) showed that Galen had never performed human dissections
b) is known for applying his knowledge of chemical reactions to the human body
c) founded Santa Maria Nuova hospital
d) had a teleological view of anatomy involving the Demiurge
e) all of the above
f) a and c

3) The theory of homocentric spheres

a) was created to explain retrograde motion
b) uses at least three spheres per planet
c) fails to explain why planets get brighter and darker
d) was developed by Eudoxus of Cnidus
e) all of the above
f) a and d

4) Isaac Newton

a) described a clockwork universe involving no divine action
b) fought with Robert Boyle over the invention of calculus
c) demonstrated that white light is composed of coloured light
d) published his microscopic observations in *Micrographia*
e) all of the above
f) b and c

5) the Scholastic philosophers

a) remained rigidly tied to Aristotle's ideas
b) considered the rotation of the Earth, but only hypothetically
c) employed the impetus theory of projectile motion
d) made experiments the foundation of scientific knowledge
e) all of the above
f) b and c

6) alchemy

a) was first practiced by Paracelsus
b) was described by Newton as a pseudo-science
c) was the study of how celestial bodies affect people on Earth
d) ultimately contributed to the development of chemistry
e) all of the above
f) a and d

7) the ancient Greek atomic theories

a) held that the cosmos arose by random chance
b) had less influence than Aristotelian philosophy in the Middle Ages
c) made no distinction between the terrestrial and celestial realms
d) were a factor in the development of mechanical philosophy
e) all of the above
f) b and c

8) the Royal Society of London

a) featured discussions of religion and politics in addition to science
b) published the first scientific journal
c) excluded Robert Hooke on account of his dangerous ideas
d) published the first account of telescopic astronomy
e) all of the above
f) c and d

9) Caroline Herschel

a) was an accomplished midwife and herbalist
b) discovered the planet Uranus
c) promoted the geo-heliocentric theory
d) published a huge catalogue of nebulae in her seventies
e) all of the above
f) b and c

10) Copernicus' book, *De revolutionibus* ("On the Revolutions of the Heavenly Spheres")

a) included a misleading preface added by Andreas Osiander
b) claims that the Earth has three motions
c) eventually led Copernicus to be executed by the Roman Inquisition
d) argues that orbits are elliptical
e) all of the above
f) a and b

Section Two: Fill in the Blank – complete the sentence by adding one or two words, recording your answer IN THE EXAM BOOKLET – 1 point each (15 points total)

1) According to _____ philosophy, all natural phenomena can be explained in terms of matter in motion.
2) In Ptolemaic astronomy, an _____ is a normal circular orbit, but with the Earth outside the centre.
3) _____ was a Persian philosopher and physician who linked disease and healing to the four Aristotelian causes.
4) Johannes Kepler's third law of planetary motion, known as the _____ law, establishes a mathematical relationship between the period and radius of a planet's orbit.
5) Historian of medicine Mary E. Fissell argues that, compared to "medicine," the term _____better encompasses women's role in healthcare in the Middle Ages and the early modern period.
6) The Jesuits entered China hoping to _____ the local population, an effort that was helped by the exchange of scientific knowledge.
7) The Scholastic philosophers Jean Buridan and Nicole Oresme argued that, since we only perceive_____ motion, we cannot be sure whether the Earth or the whole cosmos rotates each day.
8) Isaac Newton's book_____ contains his three laws of motion.
9) Plato founded a school in Athens called the _____ where scholars came together to study philosophy.
10) In natural magic, the doctrine of _____ states that objects that affect each other bear a resemblance, like the brain and a walnut.
11) Copernicus' friend and student _____ published the first printed account of Copernican heliocentric cosmology and convinced Copernicus to publish *De revolutionibus*.
12) Paracelsus is known for his _____, meaning the application of chemistry to the body for medical purposes.
13) Galileo and the Jesuit Christoph Scheiner debated the nature and location of _____.

14) In Aristotle's philosophy, the _____ cause of something is its purpose.
15) The Italian Scholastic philosopher _____ is known for "compartmentalizing" Aristotelian philosophy, distinguishing between the logic, natural philosophy, and theology.

Section Three: Short Answer – answer the question with two or three sentences – 3 points each (15 points total)

1) Describe the contributions of Robert Hooke to natural philosophy.
2) Discuss the importance of the patronage system to science in the Renaissance.
3) Explain the concept of the "Medieval Gap" and why it is inadequate to explain the history of science in the Middle Ages.
4) Explain the significance of the translation movement in medieval Islamic science.
5) Discuss how European activities in the Atlantic world contributed to empirical methodologies in science.

Section Four: Essay – answer ONLY ONE of the following questions in essay format with distinct paragraphs – 20 points

1) Describe the gradual change in natural philosophers' conceptions of motion change between ancient Greece and the time of Isaac Newton.
2) How did theology interact with scientific knowledge in the period covered by this class? Refer to at least three historical cases as examples.
3) What role did experimentation play in natural philosophy in antiquity, the Middle Ages, and the early modern period? What allowed the status of experiments to change?

Total marks: 70

Thank you for a great semester!