

Examination I

Practice

Name: _____

Signature: _____

Student ID number: _____

Table: _____

Instructions:

On the scannable answer sheet:

- Put your name (last name first!) and ID number (in col. A-J).
- Identify the form in Special Codes column K.
- Answer all 50 questions using a number 2 pencil.

In addition:

- Do not open your exam until instructed to do so.
- Be sure to also answer each question in the blanks provided on this exam.
- You may not use any notes, texts, calculators or communications devices.
- All work must be your own.
- You have 50 minutes.

Notice

This practice exam is an edited version of Exam I from Fall, 2006.

Questions from material covered in Unit II have been omitted, and as a result only 32 questions remain.

Exam I for Spring, 2007 will consist of 50 questions covering the introductory material and Unit I only.

Keep in mind that the emphasis of some of the course material has changed from last semester to this one. In particular, you can expect more questions on the celestial sphere, the moon, and how science works in general. Text in *italics* below are added comments.

For questions 1 through 8, match the civilizations listed below to the following statements.

- a. **The Egyptians** before Alexander the Great
- b. **The Mesopotamians** before Alexander the Great
- c. **The Greeks** before the fall of Rome
- d. **Europe** in the centuries following the fall of Rome
- e. **The Arabs** after the rise of Islam

_____ 1. They preserved the classic writings of previous cultures by translating them, and they eventually passed them on to others.

_____ 2. Their relative safety and protection led to a static culture and little scientific progress.

_____ 3. They dared to think that they could ignore explanations involving the gods and understand the Universe by themselves.

_____ 4. Their fears of the actions of the gods led to a strong interest in astrology, which led them to carefully monitor the movements of the planets.

_____ 5. They ignored and forgot the astronomy developed by previous cultures and limited their astronomy to what did not contradict sacred texts.

_____ 6. They developed the epicycle and deferent to explain the retrograde motion of the planets.

_____ 7. They developed the system of homocentric spheres to explain the retrograde motion of the planets.

_____ 8. They invented algebra.

For questions 9 through 16, match the people listed below with the following achievements.

- a. Aristarchus
- b. Ptolemy
- c. Eratosthenes
- d. Thales
- e. Plato

_____ 9. Is considered the father of Western philosophy.

_____ 10. Developed a detailed model of the motions of all planets within the framework of a geocentric Solar System.

_____ 11. Measured the circumference of the Earth using shadows on the summer solstice.

_____ 12. Measured the relative sizes and distances of the Earth, Moon, and Sun.

_____ 13. Argued for a heliocentric Solar System, but is better known for other achievements.

_____ 14. Believed in a world of forms vs. a world of our observations and also taught Aristotle.

_____ 15. Wrote Tetrabiblos, still the classic text on astrology.

_____ 16. Argued that the arche was water.

For questions 17 through 24, match the people listed below with the following achievements.

- a. Isaac Newton
- b. Galileo Galilei
- c. Johannes Kepler
- d. Tycho Brahe
- e. Jean Buridan (*Only mentioned in passing this semester - he's the answer to 19.*)

____ 17. Discovered that the planets orbit the Sun in ellipses, not circles or combinations of circles.

____ 18. Argued that the force that keeps the Moon moving around the Earth is the same force which causes objects to fall to the ground.

____ 19. Was the first European to show that Aristotle's Laws of Motion could not explain ballistics.

____ 20. Made the observations of Mars which led to the modern model of planetary motion.

____ 21. First used a telescope to study the heavens.

____ 22. Discovered a relation between the orbital periods and distances of the planets.

____ 23. Had a green nose.

____ 24. Was tried by the Roman Inquisition.

_____ 25. If the Moon is full, how far is it from the Sun (what is its elongation angle)?

- a. 0°
- b. 45°
- c. 90°
- d. 135°
- e. 180°

_____ 26. What conditions must be met for a total Solar eclipse?

- a. The Moon must be new.
- b. The line of nodes must point at the Sun.
- c. The Moon must be on the ecliptic.
- d. The Moon's angular size must match the Sun's.
- e. All of the above.

_____ 27. The homocentric spheres proposed by Eudoxus could not reproduce which of the following?

- a. The motion of the Sun.
- b. The retrograde motion of the inferior planets.
- c. The retrograde motion of the superior planets.
- d. The increased brightness of superior planets when they were in retrograde.
- e. Eudoxan spheres could explain all of the above.

_____ 28. The Copernican model of the Solar System offered which of the following advantages over the geocentric model?

- a. It explained why the inferior planets stay close to the Sun on the ecliptic.
- b. It provided a straightforward means of calculating the distances from the Sun to the superior and inferior planets.
- c. It explained why the superior planets must be at opposition when in retrograde.
- d. All of the above.
- e. None of the above.

_____ 29. Who has been blamed by historians for burning the Library at Alexandria?
(Only mentioned in passing this semester.)

- a. The Romans.
- b. The Christians.
- c. The Muslims.
- d. The Martians.
- e. Three of the above.

_____ 30. Which of the following were used by Copernicus to model the orbits of the planets in his heliocentric model of the Solar System?

- a. Epicycles.
- b. Deferents.
- c. Circles.
- d. Eccentrics.
- e. All of the above.

_____ 31. Kepler's First Law states that ...

- a. each force is countered with an equal and opposite force.
- b. the line between planets and the Sun sweeps out equal areas in equal times.
- c. an object not subjected to any force will continue to move (or not move) with the same speed, in the same direction.
- d. planets orbit the Sun in ellipses, with the Sun at one focus.
- e. None of the above.

_____ 32. Galileo's observations of the Moon and Sun revealed ...

- a. that heavenly bodies were imperfect.
- b. that bodies other than the Earth could be the center of orbital motion.
- c. phases that contradicted the geocentric model.
- d. that comets were not in the Earth's atmosphere.
- e. All of the above.