AUBURN UNIVERSITY

SUMMER 1990

ASTRONOMY TEST I

NAME _____ STUDENT NUMBER _____

There are a possible 106 points.

Section I. TRUE/FALSE (2 points each)

_____ 1. A light year is a unit of time.

_____ 2. The zenith lies on the meridian.

_____ 3. At some point in time, we can see an object at $-40°$ declination here in Auburn (latitude $33°$ N).

_____ 4. The two coordinates used in the equatorial coordinate system are right ascension and latitude.

_____ 5. The first point of Aries is a point where the ecliptic and the celestial equator intersect.

_____ 6. The seasons on the Earth are due to the different distances of the Earth from the Sun at different times of the year.

_____ 7. The Sun is on the Tropic of Capricorn on the winter equinox.

_____ 8. The Gregorian Calendar is more accurate then the Julian calendar.

_____ 9. The only time the Moon is full is when it is in conjunction with the Sun.

_____ 10. The only time a total lunar eclipse can occur is when the Moon is full.

_____ 11. You see a partial solar eclipse when you are in the umbra of the Moon's shadow.

_____ 12. The retrograde motion of the planets is due to their movement on epicycles.

_____ 13. Kepler's first law of planetary motion says that planets move in perfect circles.

_____ 14. Galileo discovered four bodies orbiting Jupiter, proving that not everything orbits the Earth.

_____ 15. Weight and mass can be measured in the same units.

_____ 16. Power is energy per unit of time.

_____ 17. Absolute zero is the temperature at which water freezes.

_____ 18. The Moon is in synchronous rotation with the Earth.

_____ 19. Apogee is the point in a satellites orbit where it is farthest from the Earth.

_____ 20. The property of light in which it bends around corners is called polarization.

_____ 21. The Hubble Space Telescope is presently operating as desired.

_____ 22. The 10 meter Keck telescope will have a mirror made up of hexagonal segments.

Section II. MULTIPLE CHOICE (2 points each)

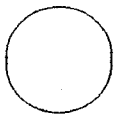
_____ 1. An astronomical unit is the distance
(a) from the Earth to the Moon
(b) from the Earth to the Sun
(c) from the Earth to the nearest star
(d) light travels in one year.

_____ 2. If a star is on the meridian at midnight (local solar time) one night, it will be on the meridian the next night at
(a) midnight
(b) 12:04 am
(c) 11:56 pm
(d) it depends on the right ascension of the star.

_____ 3. If the Moon is at quadrature, then its phase is
(a) full
(b) new
(c) first quarter or third quarter
(d) second quarter.

_____ 4. If the Moon is waxing, then it is between:
(a) new and full
(b) first quarter and third quarter
(c) full and new
(d) third quarter and first quarter.

5. Draw a gibbous moon by darkening the appropriate portion:



_____ 6. During a total solar eclipse, the Moon is
(a) full
(b) new
(c) first quarter
(d) third quarter

_____ 7. Eratosthenes was the first to
(a) introduce the concept of the celestial sphere
(b) use stellar magnitudes
(c) eat spicy food
(d) determine the size of the Earth.

_____ 8. Newton's universal law of gravitation says
(a) $F = ma$
(b) $F = \frac{Gm_1m_2}{r^2}$
(c) $P^2 = a^3$
(d) $E = mc^2$

_____ 9. The radiation emitted from an object due to its temperature is
(a) thermal radiation
(b) continuous radiation
(c) absorption lines
(d) emission lines.

_____ 10. The hotter an object, the shorter the wavelength of radiation that it emits is
(a) Newton's third law
(b) Kirchhoff's law
(c) Stefan-Boltzmann law
(d) Wien's law.

_____ 11. If a star is approaching you very quickly, its light will be
(a) redshifted
(b) lower in pitch
(c) blueshifted
(d) higher in pitch.

Section III. FILL IN THE BLANK (2 points each)

1. The constellations through which the ecliptic passes are called _____.

2. _____ is the slow shifting of a star's position on the celestial sphere caused by the wobble of the Earth's rotational axis.

3. During a solar eclipse, the bits of light that pass through the valleys and between the mountains of the Moon are called _____.

4. The Greek astronomer _____ correctly explained solar and lunar eclipses.

5. _____ (c. 300 BC) said the Sun was the center of the universe with the Earth and other planets revolving about it.

6. _____ used the idea of crystalline spheres to explain the motions of the planets, Sun, and Moon about a stationary Earth. This model was used throughout the Dark Ages to predict planetary positions.

7. Copernicus' major contribution to astronomy was _____.

8. Tycho Brahe's MAJOR contibution to astronomy was _____.

9. Galileo was persecuted by the church because _____.

10. Newton invented calculus to _____

11. The order of electromagnetic radiation from longest to shortest wavelength is _____,

_____, _____, _____, _____, _____.

12. The order of visible light from longest to shortest wavelength is _____, _____,

_____, _____, _____, _____, _____.

13. A refracting telescope uses a _____ to gather light, whereas a reflecting telescope uses a _____.

14. An ultraviolet or X-ray observatory must be located _____.

Section IV. DISCUSSION (4 points each)

1. What is the difference between astronomy and astrology?

2. Draw a diagram for a superior planet and label when it is at opposition, conjunction, and quadrature.

3. Draw the focal arrangements of prime focus, Newtonian focus, and Cassegrain focus for reflecting telescopes.