

ASTRONOMY TEST II

NAME _____ STUDENT NUMBER _____

There are a possible 109 points.

Section I. TRUE/FALSE (1 point each)

- _____ 1. P waves (compressional waves) can be transmitted through a liquid, whereas S waves (transverse waves) cannot.
- _____ 2. In the plate tectonic theory, the plates drift around on the low viscosity asthenosphere.
- _____ 3. The magnetosphere of the Earth is a result of the Earth's magnetic field and therefore is symmetrical.
- _____ 4. The magnetic field of a planet can reverse (swapping the north and south magnetic poles).
- _____ 5. The regolith on the Moon is a dense concretion of basalts.
- _____ 6. Venus appears so bright because of the greenhouse effect.
- _____ 7. Water vapor in the early atmosphere of Venus acted to cool the planet.
- _____ 8. Mars' orbit is highly eccentric and when it is close to the Sun, the planet is much warmer than when it is distant from the Sun.
- _____ 9. The Viking landers confirmed the existence of microbial life on Mars.
- _____ 10. Due to the orbit of Mariner 10, it was only able to see one side of Mercury, although it made three separate passes.
- _____ 11. Jupiter is rigid with a definite surface.
- _____ 12. Jupiter emits more energy than it receives from the Sun.
- _____ 13. Saturn is similar in composition to Jupiter.
- _____ 14. Titan has a thick atmosphere containing methane.

- _____ 15. The Roche limit is the distance from a planet at which a moon enters synchronous rotation.
- _____ 16. The best current theories indicate that the rings of planets are very stable, long lived structures.
- _____ 17. Uranus is similar in composition to Earth.
- _____ 18. All known moons of Uranus are in synchronous rotation.
- _____ 19. The atmosphere of Neptune is very turbulent with clouds of methane.
- _____ 20. Pluto has a highly elliptical orbit that makes a relatively large angle with respect to the ecliptic plane.
- _____ 21. Pluto has a permanent atmosphere of CO₂.
- _____ 22. The asteroid belt is probably the result of the disintegration of an ancient planet.

Section II. MULTIPLE CHOICE (1 point each)

- _____ 1. The Earth's atmosphere is 77%
(a) nitrogen
(b) oxygen
(c) water vapor
(d) carbon dioxide.
- _____ 2. The aurora of the Earth occur in the
(a) troposphere
(b) stratosphere
(c) hydrosphere
(d) ionosphere.
- _____ 3. Which of the following is NOT a property of Venus
(a) it has a magnetic field
(b) it has a retrograde rotation
(c) there is sulfuric acid in the atmosphere
(d) the surface air pressure is 90 atmospheres.
- _____ 4. Which of the following is NOT a property of Mars
(a) it has polar caps
(b) it has a canal system
(c) it has global dust storms
(d) it has the largest mountain in the solar system.

- _____ 5. Which of the following is NOT a property of Mercury
- (a) it has a magnetosphere
 - (b) it has cliffs (scarps)
 - (c) it has a crust of variable density
 - (d) it has an atmosphere.
- _____ 6. Which of the following is NOT a property of Jupiter
- (a) it has a layer of liquid metallic hydrogen
 - (b) it has a magnetosphere
 - (c) it has volcanic activity
 - (d) it has differential rotation.
- _____ 7. Which of the following is NOT a property of Saturn
- (a) it has a magnetosphere
 - (b) there is the presence of plate tectonics
 - (c) it has differential rotation
 - (d) it has an oblate shape.
- _____ 8. Which of the following is NOT a property of Uranus
- (a) its rotational axis is tilted 98°
 - (b) it has a magnetic field
 - (c) it has a layer of liquid metallic hydrogen
 - (d) it has a ring system.
- _____ 9. Which of the following is NOT a property of Neptune
- (a) it has a Great White Spot
 - (b) it has a magnetic field
 - (c) it has auroras
 - (d) it has a ring system.
- _____ 10. Which of the following sequences of names could be used, consecutively, to describe a single particle
- (a) meteor, meteoroid, meteorite
 - (b) meteoroid, meteor, meteorite
 - (c) meteorite, meteor, meteoroid
 - (d) meteor, meteorite, meteoroid.

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

1. _____ is the fraction of incident light that is reflected from a surface.
2. The layers of the Earth are _____, _____, _____, and _____.

3. The layers of the Earth's mantle are _____, _____, and _____.
4. The present composition of the Earth's atmosphere (in particular the O₂) is due to _____.
5. Some features on the surface of the Moon that are visible with a small telescope are _____, _____, and _____.
6. On the Moon, the _____ are the results of large impacts which broke the crust and produced large, flat lava fields.
7. The CO₂ in Venus' atmosphere produces a _____.
8. The three stages of planetary exploration are _____, _____, and _____.
9. Mars is red due to the presence of _____ on its surface.
10. The two moons of Mars are _____ and _____.
11. _____ is the relationship between orbital and spin periods of a satellite or planet.
12. _____ is rippled in appearance and is directly opposite Caloris Planitia on Mercury.
13. The main two elements in Jupiter are _____ and _____.
14. The two types of striations in Jupiter's atmosphere are dark _____ and bright _____.
15. The four Galilean satellites of Jupiter are _____, _____, _____, and _____.
16. Saturn puts out 1.8 times as much energy as it takes in. The excess energy is from _____.
17. Name four satellites of Saturn: _____, _____, _____, and _____.

18. Other than Titan, briefly describe one of Saturn's moons _____
_____.
19. The spokes on Saturn's rings are _____.
20. _____ discovered Uranus.
21. Name any three moons of Uranus: _____, _____, and _____.
22. Briefly describe one moon of Uranus: _____
_____.
23. Briefly describe Triton (the largest moon of Neptune): _____
_____.
24. The three types (or compositions) of asteroids are _____, _____, and _____.
25. _____ are "blank spots" in the asteroid belt due to orbital resonances with Jupiter.
26. Halley's comet is of historical interest because _____.
27. _____ is a faint belt of hazy light that stretches along the ecliptic and is seen just after sunset or just before sunrise.

Section IV. DISCUSSION

Do exactly 3 for the following 4. Put an 'X' through the number of the one that you want to omit. (5 points each)

1. Explain the greenhouse effect in some detail.

2. List and briefly describe the three types of rocks.

3. State the best hypothesis for the formation of the Moon. What is the evidence in support of this?

4. Discuss Fred Whipple's dirty snowball theory of comets. Include some mention of the sizes of the components and the two types of tails.

DO THE FOLLOWING PROBLEM. (8 points)

5. Describe the evolution of the solar system.