

Test on Chapters 1 & 2

The value of each question is shown. Please answer each question in the space provided

1. (5) What is the ratio of the electronic force to the gravitational force?
2. (5) How does this ratio help us understand why we're so small and the universe is so big?
3. (5) What are constellations? Are the stars in constellations close together in space?
4. (5) How many stars are in Orion's belt and what is the approximate angular distance between them?
5. (5) What causes earth's daily cycle and how long is it? What causes earth's yearly cycle and how long is it?
6. (5) How many time zones are there? At the equator, what is the approximate distance in miles between time zones?
7. (5) If you're standing on the equator, approximately how fast are you going because of the rotation of the earth on its axis? How fast at the north pole?
8. (5) What causes the seasons? At the latitude of Alameda, why is summer hotter than winter?
9. (5) Why does the shape of the moon change? If it's not cloudy and you see the moon tonight, what will its shape be?
10. (5) What causes a lunar eclipse? What causes a solar eclipse?
11. (5) What is required for a theory to be scientific?
12. (5) What was the geocentric theory of the universe?

13. (5) What do we mean by planetary retrograde motion?
14. (5) Even though Copernicus's heliocentric model explained retrograde motion, many found his theory hard to accept. Why?
15. (5) What is parallax? How is it used by astronomers? What limits its use?
16. (5) What is Kepler's first law? Why did this law improve Copernicus's heliocentric model?
17. (5) Why was Galileo's discovery of the moons of Jupiter important?
18. (5) Why did Newton's First and Second laws help explain how it could be that the earth was orbiting the sun?
19. (5) Why is Newton's third law necessary?
20. (5) From Newton's point of view, why was an apple like the moon?
21. (5) What does AU stand for and what is its value?
22. (5) How does the gravitational force vary with the mass of two objects and the distance between them?
23. (5) Suppose two planets are 1 AU apart. How does the gravitational force between these two planets change if we change the distance between them to 2 AU?
24. (10) Given that the semi-major axis of Mercury is approximately 0.4 AU, use Kepler's third law to compare Mercury's period (year) to Earth's period (year). Show your calculation.