

Instructions: This test has the same format as before. Part A consists of short answer questions where you are to pick the best work, phrase, or choice of answers which best answers or, in some cases, defines the statement. Part B consists of longer answer questions. Make your answers clear and concise. If you need more room turn over the test paper and continue on the back but please indicate on front. For problems it is the procedure that will be checked, not only the answer, so please try to make it clear. So for this, the third poets' test of the term, Good Luck!

Declaration: I elect to do a (term paper, lab project). Please circle. The title is _____ and it (has, has not) been approved.

A. Short Answer Questions (1 ½ points each question except where noted).

- _____ 1. (2) A planet in our solar system which is characterized by a great red spot is called ? while a planet in our solar system which is characterized by its rings is called ?.
- _____ 2. (2) The two stars that form the front part of the bowl of the Big Dipper point toward a star named ? which does not move in the sky as night progresses (All the stars rotate around it!). This star also forms the end of another constellation called ?.
- _____ 3. (3) The molecule $C_6H_{12}O_8$ consists of ? carbon atoms, ? hydrogen atoms, and ? oxygen atoms.
- _____,_____,_____ 6. (4) The atom ^{90}Sr has ? protons and ? neutrons in the nucleus and ? electrons total for an electrically neutral atom. Of these electrons, there are ? in the first shell, ? in the second shell, ? in the third shell, ? in the fourth and shell, and ? in the fifth shell.
- _____ 5. (2) From the periodic table, pick all of the following elements that have one electron in its outer shell (a) Mg, (b) Na, (c) Sr, (d) Cs, (e) Cl, (f) S.
- _____ 6. The weighted-average mass numbers of all naturally occurring isotopes of a particular element is called ? for that element.
- _____ 7. Knowing the name of an element still does not allow us to know the number of protons in its nucleus (true, false).
- _____ 8. (2) A wave travels a distance of one ? in a time of one ? (fill in the appropriate physical quantities).
- _____ 9. (2) REVIEW QUESTION: A physical quantity designating the time required for a wave to undergo one complete oscillation is called ?, and is in units of ?.
- _____ 10. The "domino" effect is an example of what kind of wave--transverse or longitudinal?
- _____ 11. (2) A flash of lightning is seen but the thunder is not heard until 2 seconds later. The lightning struck ? away.
- _____ 12. (2) A physical quantity designating the number of waves hitting an observer per second is called ? and is in units of ?. (Note: This same physical quantity is also the number of cycles per sec emitted by a source.)

- _____ 13. At a condensation (or compression) the air pressure, as well as density, is ? it would be in the absence of the condensation, (a) higher than; (b) lower than; (c) the same as.
- _____ 14. The mass of an object per unit volume is a description of a physical quantity called ?.
- _____ 15. The number of protons plus neutrons is called ?.
- _____ 16. If the distance from a condensation of a sound wave to the next successive rarefaction is 1.4 meters, what is the wavelength of the wave?
- _____ 17. (2) A pulse travels the length of a 15-meter-long piece of string in 3 sec. The speed of the pulse is ?.
- _____ 18. One divided by the "period" gives another physical quantity called ?.
- _____ 19. (2) REVIEW QUESTION: A person weighing 160 lb here on the surface of the earth travels to planet X which has a radius of 5 times that of the earth and a mass 10 times that of the earth. The person's new weight on the surface of planet X is now ?.
- _____ 20. The orbital velocity of the planet Venus is (a) greater than (b) equal to (c) less than the orbital velocity of the planet Mars.
- _____ 21. (2) REVIEW QUESTION: All planets travel in a geometric path called an ? with the sun at one ?.
- _____ 22. (+2 BONUS POINTS!!) What accounts for the fact that both Venus and Mars are much warmer than one would expect?
- _____ 23. (2) Our galaxy is called ? and is one of 17 galaxies that make up _____
The next astronomical unit which is called a ?.
- _____ 24. (2) An astronomical curiosity that has an escape velocity so large that not even light can escape is called a ?.
- _____ 25. (2) The fundamental frequency of a guitar string is 256 Hz. It's second harmonic frequency is ? and the frequency of its third overtone is ?.

B. Longer Answer Questions

1. (4) What causes ocean tides? Why are there two high (and two low) tides per day.

2. (3) Explain what you would see with a 1/4" drop of water if you
(a) magnified it 2000 times.

(b) magnified it another 2000 times.

(c) magnified it another 250 times.

3. (5) What are standing waves? What is necessary for them to be set up in a slinky? What then are nodes and antinodes?

4. (4) Explain how one might find other planets that make up our solar system--namely, where should one look in the sky in order to see them? Also, why is it that at night, some planets aren't observable? Hint: In order to answer the first part of this question, THINK about what is special about the *plane* of the earth's orbit, the plane of our solar system, and the *plane* of the galaxy to which we are a part.

5. (4) Why are electron shells important in determining how molecules are formed from atoms? Give an example of a molecule formed from atoms by discussing the number of electrons of each in the outer shell.

6. (3) Define resonance and give an example.
7. (5) Define and distinguish between a longitudinal wave and a transverse wave and give two examples of each.
8. (4) Explain what is meant by the term "escape velocity." Use this concept to explain why it is that the moon has no atmosphere, why the earth has an atmosphere of oxygen and nitrogen but not hydrogen and helium, and finally why the atmosphere of Saturn retains hydrogen and helium.
9. Discuss, using the concepts of the revolution of the earth and the inclination of the earth on its axis, (a) (2) summer and winter for the northern hemisphere, (b) (1) the winter solstice, (c) (1) the summer solstice, and (d) (1) the fall or spring equinox.
10. (4) REVIEW QUESTION: State two of Kepler's three laws and include a diagram and/or example of each case.

10. Please answer the following questions in this part by choosing your answer from the following list of possible choices: (½ point each blank.) (Note: Some terms may be used more than once and some not at all!)

Acropol
Carbon Dioxide
Earth
Eccentricity
Ecliptic
Equatorial diameter

Helium
Hydrogen
Inclination of Axes
Jupiter
Mars
Methane

Mercury
Neptune
Nitrogen
Oblateness
Orbital velocity
Oxygen

Pluto
Revolution
Rotation
Saturn
Uranus
Venus
Xenon

- a) A term which can be used to best explain why we have night and day. _____
- b) The planet whose rings can be seen through telescopes here on earth. _____
- c) Is the closest planet to the sun. _____
- d) Is the most massive planet. _____
- e) Is the further-most planet from the sun. _____
- f) Two planets which turn on their axes backward ("retrograde")
from every other planet known in our solar system. _____
- g) The planet having the greatest orbital velocity is? _____
- h) A planet whose moons were observed by Galileo. _____
- i) The planet with the hottest surface is? _____
- j) The planets which are known to have substantial amounts of
hydrogen and helium in their atmosphere are? _____
- k) The term designating the time to make one complete cycle around the sun. _____
- l) The term designating the time a heavenly body takes to make one
complete turn on its own axis. _____
- m) A term designating the plane of the earth's orbit. _____
- n) All other planets lie very nearly in the plane of the earth's
orbit except for one. What planet is it? _____
- o) The planet with the greatest volume is? _____
- p) The planet with the least mass is? _____
- q) The most dense planet is? _____
- r) The planet having the largest surface gravity is? _____
- s) The planet which has the most moons (39 moons so far) is? _____
- t) The planet which has the second most moons (30 moons so far) is? _____
- u) A measure of how "pancake-like" a planet (or object) is? _____