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 point each question except where noted).

______ 1. The sun passes across the sky in the plane of the ecliptic. (true, false)

______ 2. The distance that light travels in one year is an astronomical distance unit called ___.

______ 3. The first law of Kepler tells us that all planets travel in an orbit called an ___.

______ 4. Why is it that all the constellations appear to move around in a circle as night progresses?

______ 5. Which planet is known for its "great red spot."

______ 6. (1 ½) Which three planets all have twenty or more moons?

______ 7. (2) REVIEW QUESTION: A person weighing 156 lb here on earth goes to planet X having a radius three times that of the earth and a mass six times as large. The person will weigh ___ on the surface of that planet.

______ 8. (2) The planets which are known to have substantial amounts of hydrogen and helium in their atmosphere are? ______, ______, and ______

______ 9. (2) The present atmosphere of the earth consists of about 21% ___ and about 78% ___.

______ 10. The galaxy of which our solar system is a part is called ___.

______ 11. Our galaxy is a ___ galaxy. Choose from (a) globular (b) elliptical (c) spiral (d) Kepler

12. (2) An "equinox" is ________________________________.

13. (2) The angular position of the axis of the earth as related to the position of the sun when the summer "solstice" occurs is ________________________________.

14. (2) The physical quantity "density" is defined as ________________________________ and, of all the planets in our solar system, the one that is the most dense is the planet ___.

______ 15. (2) Suppose that for a whole month that there was no cloud cover. How many days of that month might the moon be seen during the day? Explain ________________________________
16. (2) The particular astronomical term that designates the time that it takes for a planet to make one complete trip around the sun is called the period of ___, while the term that designates the time that it takes for a planet to undergo one complete turn about its axis is called the period of ___.

17. What is the significance of the "wobbling" of a star? ____________________________

18. What major astronomical event occurs each year around June 21? ____________________________

19. (2) A planet who rings can be seen through telescopes here on earth is ___, while the most eccentric orbit of all planets in our solar system is ___.

20. The planet Venus is extremely hot because of the presence of ___.

21. (1 ½) From the periodic chart list three symbols of elements which have only two electrons in their outer shell. ___ ___ ___

22. The number of protons in the nucleus of an atom is called the ___.

23. (1 ½) Two atoms which have the same number of protons in the nucleus but a different number of neutrons are called ___. Two examples would be ___ and ___.

24. (4) For Potassium 40 (⁴⁰K), the number of protons in the nucleus is ___, the number of neutrons in the nucleus is ___, the total number of electrons in a neutral Potassium 40 atom is ___. Of these total number of electrons, ___, ___, ___, and ___ are in the first shell, ___, ___ are in the second shell, ___, ___ are in the third, and ___ are in the fourth.

25. (1 ½) The molecule C₁₀H₁₂O₁₄ consists of ___ carbon atoms, ___ hydrogen atoms, and ___ oxygen atoms.

26. (2) A physical quantity designating the number of waves given off by a vibrating object every second is called ___, and is in units of ___.

27. A physical quantity designating the time that it take for one complete cycle or oscillation to occur is called ___.

28. In a time of one period, a wave travels a distance of one ___. (fill in the appropriate physical quantity).

29. One divided by the "period" gives another physical quantity called ___.

30. The speed of a sound wave is a measure of the speed of the disturbance and not the speed of a typical molecule of air. (true, false)

31. At a rarefaction (or expansion) the air pressure (as well as the density of air) is ___. Choose from: (a) higher than; (b) lower than; (c) the same as.

32. If the distance from a condensation (or compression) of a sound wave to the next successive rarefaction (or expansion) is 1.5 meters, what is the wavelength of the wave?

33. (2) A pulse travels the length of a 5.3-meter-long piece of string in 3.0 s. The speed of the pulse is ___. 
34. (1) If the distance from a condensation (or compression) of a sound wave to the next successive condensation (or compression) is 1.5 meters, what is the wavelength of the wave?

35. (2) The fundamental frequency of vibration of a guitar string is 256 Hz. It's fourth harmonic frequency is ___?___ and the frequency of oscillation of its second overtone is ___?___.

36. (2) The fundamental frequency of vibration of an open-ended pipe is 256 Hz. It's fourth harmonic frequency is ___?___ and the frequency of oscillation of its first overtone is ___?___.

B. Longer Answer Questions

1. (4) Distinguish between true weightlessness and apparent weightlessness.

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

3. (4) List 4 characteristics necessary for a carbon-oxygen-water type of life somewhere else in our galaxy according to Dr. Bracewell of Stanford University.

4. (3) If you take a water drop 1/4" in diameter and magnify it, explain what you would see if you magnified it by (a) x2000 (b) x2000 (again) and then (c) by 250 times.
5. (5) 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. (5) (a) (2) What are standing waves? (b) (1) What is necessary for them to be set up in a slinky? (c) (2) What then are nodes and antinodes?

7. (4) Define and distinguish between a longitudinal wave and a transverse wave and give two examples of each.

8. Define or briefly describe the following terms:

   (2) atomic mass (or atomic “weight”)

   (2) Alpha Centauri

   (2) resonance
8. Define or briefly describe the following terms continued:

   (2) retrograde motion of a planet and list two planets that experience this phenomenon

   (2) black hole

   (2) escape velocity

9. Please answer the following questions in this part by choosing your answer from the following list of possible choices: (½ point each blank.) (Note: The terms that follow can be used more than once.)

   Acropol  Helium  Mercury  Pluto
   Carbon Dioxide  Hydrogen  Neptune  Revolution
   Earth  Inclination of Axes  Nitrogen  Rotation
   Eccentricity  Jupiter  Oblateness  Saturn
   Ecliptic  Mars  Orbital velocity  Uranus
   Equatorial diameter  Methane  Oxygen  Venus

a) A term designating the plane of the earth's orbit.

b) All other planets lie very nearly in the plane of the earth's orbit except for one. What planet is it?

c) A measure of how "pancake-like" a planet (or object) is?

d) The planets which have mostly carbon dioxide in their atmosphere are?

e) The planet taking the shortest time to make one complete trip around the sun is?

f) The term which can be used to best explain why we have night and day.

g) Is the closest planet to the sun.

h) The planet having the greatest orbital velocity is?

i) The planet with the hottest surface is?

j) The fact that, for the Earth, the distance from the North Pole to the South Pole is less than the equatorial diameter is expressed by which physical quantity?