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Your Name (First M. Last)

School or Institution Name (University at Place or Town, State)

**Background Question** **– Describe Kepler’s three laws of planetary motion.**

**Objective**: This assignment is aimed at analyzing the factors that influence the motions of the planets. This assignment will particularly analyze the study about such objects during the planets movement around the Sun. the basic premise is to analyze and to know exactly as to what constrain the movement of the planet. Is it relay a Meta thing, which disrupts the motion of the planets? If so, then to how much extent the motions of the planets are affected by the presence of such objects. This assignment will able the researcher to get a thorough analysis of the Kepler's laws about the motion of the planets.

**Hypothesis:** The movements of the planets conform to the laws of Kepler's, but somehow in the unavailability of the type of matter being searched that might be present in the space, it is impossible to analyze the perfect rotatory motion of the planet.

**Q1***.* List the visible planets in order of increasing distance from Sun.

Answer: The list of visible planets from the sun in the order of their increasing distance is the Sun, Mercury preceded by the Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and the Pluto, such movements have also remained observable in Brown’s observations of 2015(Brown, 2015). Although Pluto does not qualify the definition of a planet, somehow it is observable.

***Q2.*** Are the planets moving at the same speed? If not, which planet is the fastest and what planet is the slowest?

Answer: It has been noticed that the planet Jupiter is moving the fastest as compared to the movements of other planets, as it has the smallest length of the day and night. Whereas, the planet Venus is moving at the minimum speed if compared to the movements of rest of the planets in the solar system.

**Q3.** Is Mercury orbit perfectly circular or is it slightly egg-shaped?

Answer: It has been observed that the planet Mercury does not conform to the circular definition of shape, and nether it has shown any such attributes visible. Therefore, for the sake of this experiment, the mercury will be mentioned as the Egg-shaped or in simple words the oval shaped.

**Q4.** Is the Sun at the exact center of Mercury orbit?

Answer: it has been observed during the observation that as since the mercury shares, not an exact circular path, therefore it has been observed that the sun is not ion the exact middle of the planet Mercury's orbit.

**Q5.** When does Encke move the fastest? Is this in agreement with Kepler’s second law?

Answer: Universal gravitation calls for that whenever some closeness is observed between a planet and the sun, while the planet is revolving its orbital motion, some fastness will be observed in the motion of the planet. Similarly, it will appear to be moving slowly when it goes away from the sun. So since the mercury is the closest planet to the sun, it will keep on changing the speed of its motion.

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| --- | --- | --- | --- | --- |
|  |  | **Average****distance (a)** |  |  |
| **Planet** | **Period (p)** | **= (perihelion + aphelion) / 2** |  **p2** | **a3** |
|   |   |   |   |   |
|  The Earth  | 1.00 | (0.0983+1.017)/2 |   1.00 | 1.00 |
|   |   |   |   |   |
|  The Mercury  | 0.241 | (0.308+0.467)/2 |  0.3875 | 0.3875 |
|   |   |  |   |   |
|  The Mars | 1.881 | (1.666+1.381)/2 |  1.5235 | 1.5325 |
|   |   |   |   |   |
|  The Saturn  | 29.459 | (10.046+9.031)/2 |  9.5385 |  9.5385 |
|   |   |   |   |   |
|   |   |   |   |   |

**Q6.** Does your data support Kepler’s third law (p2 = a3)?

Answer: After the conclusion of this experiment, it has been observed that it does not conform to any of the laws of the Kepler’s.

**Conclusion**

During this experiment, I had faced problems in recording the observations and managing them with the variables of the tables provided. It has also remained a difficulty of adjusting the Stellarium software in accordance with the guidelines mentioned in the assignment. These observations have been also mentioned in many other observations (Sparavigna, 2017). Therefore, there might be a possibility that the table reading might not get a proper adjustment with the standard readings. Thereof, the hypothesis claimed in the starting of this assignment has been hence proved.

**References**

Brown, D., 2015. Exploring skyscape in Stellarium. Journal of Skyscape Archaeology 1, 93–112.

Sparavigna, A.C., 2017. Stellarium software and the occultation of Aldebaran observed by Copernicus. Philica 2017.