

Name: .....

Neptune code: .....

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1.) List the main special environmental conditions that arise in the space!

2.) What are the Van Allen belts?

3.) Enter the three Kepler laws!

4.) What are the main perturbation effects that are modifying the satellite's orbit around the Earth?

5.) What is the advantage using multiple rocket stages instead of using only one?

6.) How the electric propulsion system is working?

7.) What is the main application area of ceramic matrix composites in space technology?

8.) What are the main primary power source types of the satellites?

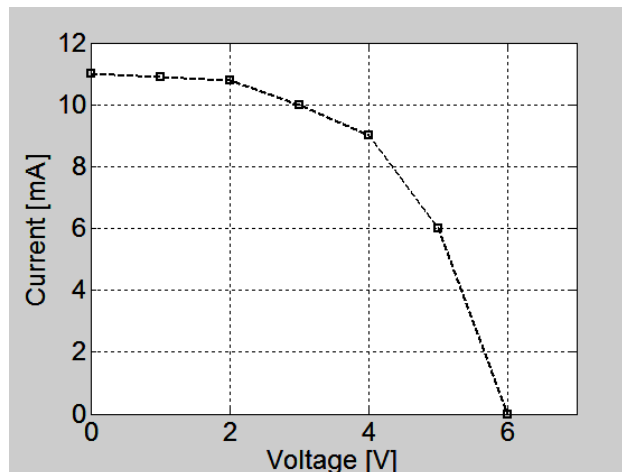
9.) What is the purpose of maximum power point tracking (MPPT) for solar panels?

10.) Which subsystem of the satellite operates a star sensor?

11.) What is the orbit speed of a geostationary satellite?

The orbit radius from the center of the Earth is **R=42.164 km**.

12.) The following figure is the voltage/current characteristics of a solar cell:



The individual values are the following:

```
U=[ 0, 1, 2, 3, 4, 5, 6]; % Voltage [V]
I=[11, 10.9, 10.8, 10, 9, 6, 0]; % Current [mA]
```

Denote on the figure the maximum power point of the solar cell! What is the power at this point?

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Questions 1-10 worth 6 points and questions 11-12 worth 20 points. (100 points maximum)

**Evaluation:**

0-59%	unsatisfactory (1)
60-69%	pass (2)
70-79%	satisfactory (3)
80-89%	good (4)
≥ 90%	excellent (5)