PART B: Short answer questions.

Answer in the spaces provided. ANSWERS TO SHORT-ANSWER QUESTIONS WRITTEN ANYWHERE OTHER THAN ON THE SPECIFIED PAGE WILL NOT COUNT FOR MARKS. Mark values are indicated with each question

1. Solar System Overview

(a) [1 mark] List two Terrestrial Planets

Earth, Mars

(b) [1 mark] List two Jovian Planets

Jupiter, Neptune

(c) [1 mark] List one dwarf planet.

~~Uranus~~ ~~Eris~~. Eris.

(c) [2 marks] Briefly describe[1] two ways in which Terrestrial planets differ from Jovian planets.

① Terrestrial planets are smaller than Jovian planets.

② Terrestrial are closer to sun than planets Jovian planets.

[1] What do we mean by "Briefly describe"? If we were answering the question "Briefly describe two differences between racing cars and cargo trucks" we might answer "Racing cars can go faster than cargo trucks. Cargo trucks can carry more than racing cars."

Score: 10.0/10.0

2. In the picture below, a comet is in an highly eccentric orbit around the Sun. Assume there are no objects besides these two in the solar system.

(a) [2 marks] Draw the comet's path if the comet, as shown, is at its aphelion (that is, the furthest it gets from the Sun during the orbit).

(b) [4 marks] Label the following points on the orbit:

- Where it is travelling the slowest with an '**S**'.
- Where it is travelling the fastest with a '**F**'.
- Where the force of gravity is the largest with a '**G**'.
- Where the acceleration has the largest magnitude with an '**A**'

(c) [3 marks] The star weighs much much much more than the comet. If the mass of the comet were to double:

- Would the force of gravity from the Sun acting on the comet change? Would it increase, decrease, or stay the same? If it changes, by how much would it change?

∵ $F = \frac{GMm}{r^2}$ ∵ $m \to 2m$ ∴ $F \to 2F$ ∴ The force will increase to double.

- Would the shape of the orbit change in any notable way? If so, (approximately) in what way?

No! ⇒ the ~~gravi~~ gravity has a positive relationship with the long axis of the rotation of the ~~orbit~~ comet, so the rotation will not change.

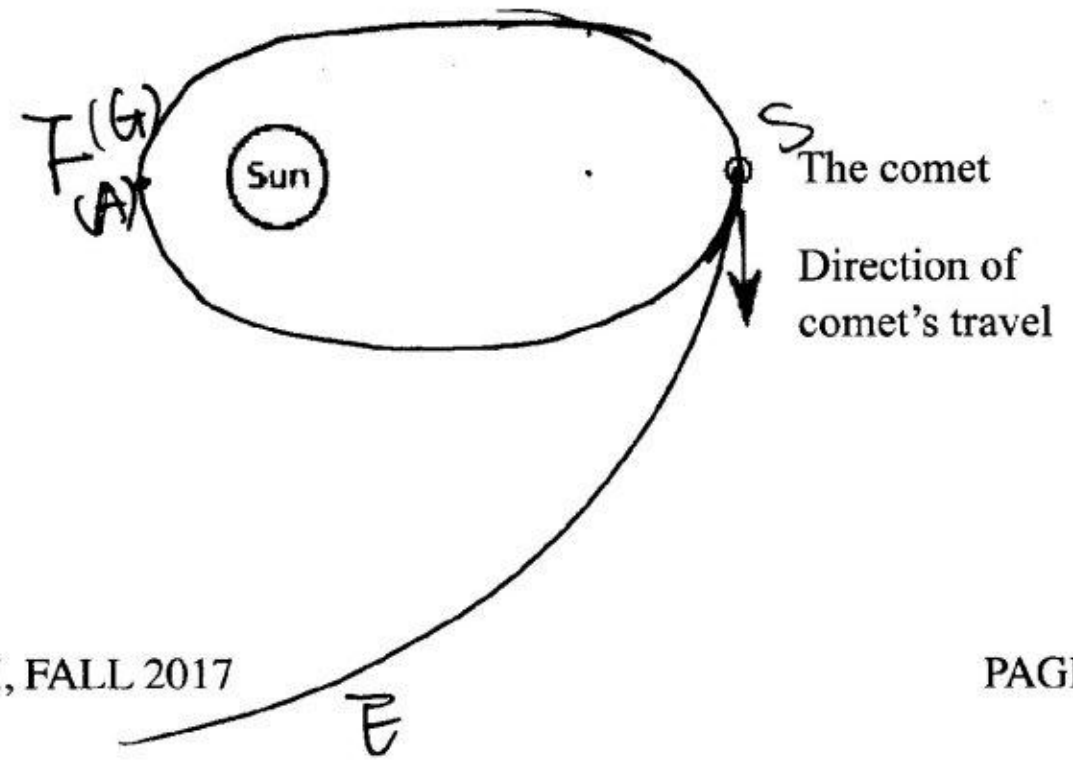
- Would the maximum speed of the comet change? Would it increase, decrease, or stay the same? If it changes, by how much would it change?

Stay the same

∵ $F = ma$

F increase to double, m increase to double, then the ~~acceleration~~ acceleration of Comet will not change, then the ~~the~~ speed will not change

(d) [1 mark] On the same figure, draw a possible path of the original comet if it were traveling faster than escape velocity but starting in the direction indicated. Label the path with an '**E**'.



Score: 2.0/5.0

3. (a) [2 marks] List three differences between the radiative zone and the convective zone of the Sun.

① The temperature of radiative zone is higher than the convective zone

② There will be flows in the convective zone, ~~but~~ but the radiative zone does not have flows

③ Radiative zone are larger than the convective zone.

(b) [2 marks] Explain how the solar thermostat controls the Sun's core temperature.

When the core ~~temperature~~ goes up, ~~it~~ the core will become larger, ~~then~~ the temperature will decrease, and ~~the core will temperature to~~ core becomes larger. Then the gravity of Sun makes the core become smaller, the temperature will ~~goes~~ go up.

(c) [1 mark] Why does the Sun emit more visible light than it does infrared light?

Because there is too much light ~~is~~ on the surface of sun, the infrared light ~~is~~ is harder to escape from the surface, it will be reflected easier.