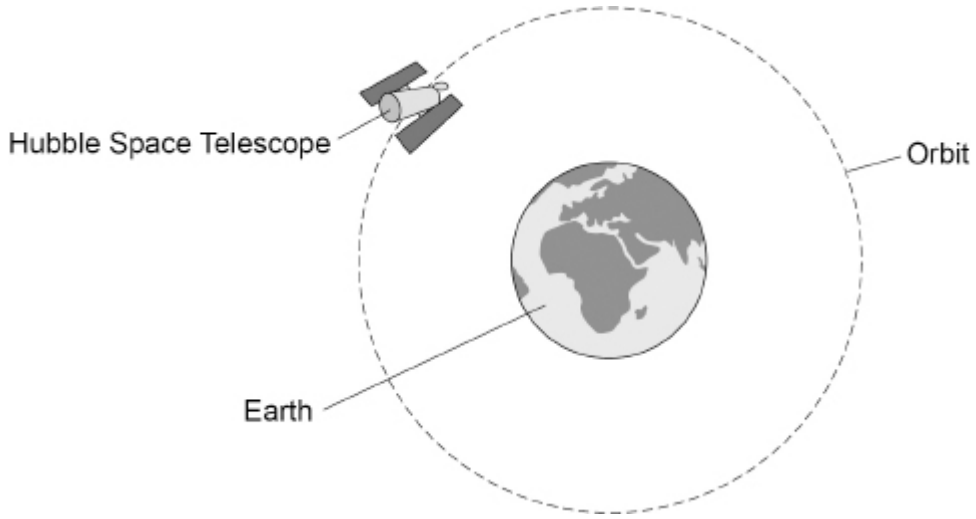
Questions are for separate science students only

Q1.

Figure 1 shows the Hubble Space Telescope orbiting the Earth. **(Physics only)**

Figure 1



(a) What name is given to an object that orbits a planet?

Tick (✓) **one** box.

A comet ☐

A satellite ☐

A star ☐

(1)

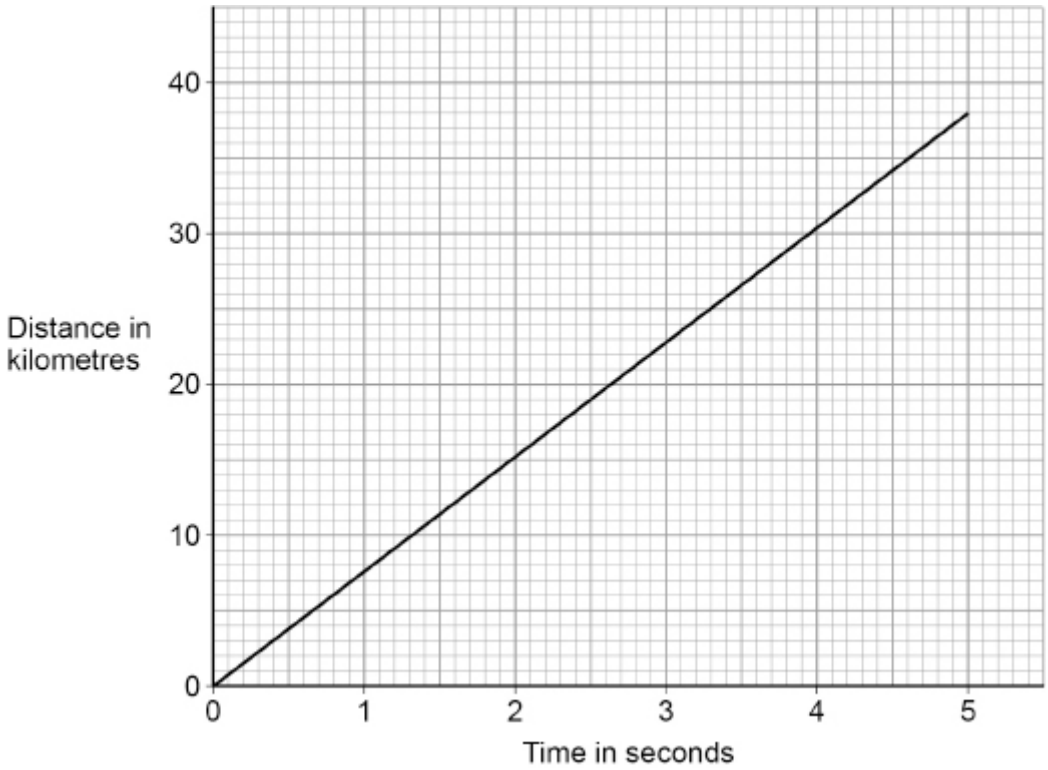
(b) The Earth exerts a gravitational force on the Hubble Space Telescope.

Draw an arrow on **Figure 1** to show the gravitational force.

(1)

(c) **Figure 2** shows how the distance travelled by the Hubble Space Telescope during its orbit changes with time.

Figure 2



The gradient of the line in **Figure 2** gives the speed of the Hubble Space Telescope.

Determine the speed of the Hubble Space Telescope.

Give your answer in km/s.

Speed = _____ km/s

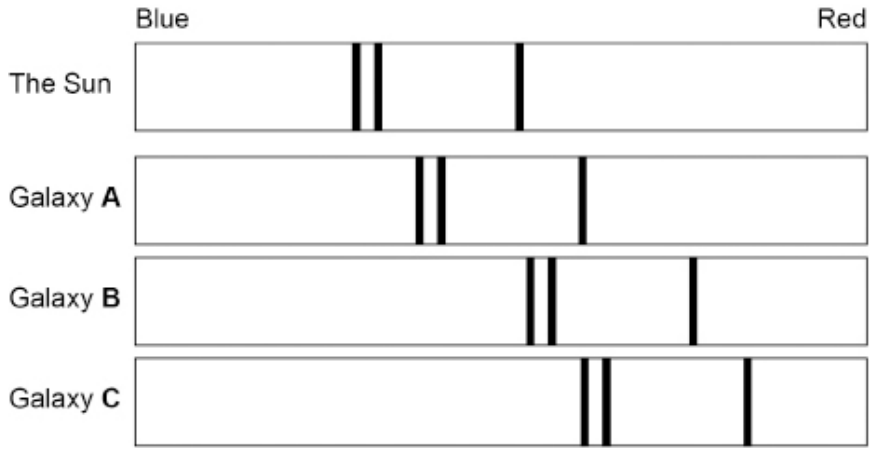
(3)

The Hubble Space Telescope can detect the visible light spectra from distant galaxies.

The visible light spectra from stars and galaxies include dark lines at specific wavelengths.

Figure 3 shows the visible light spectra from the Sun and three galaxies.

Figure 3



(d) Which galaxy is moving away from the Earth the fastest?

Tick (✓) **one** box.

Galaxy **A** ☐

Galaxy **B** ☐

Galaxy **C** ☐

(1)

(e) Which galaxy is the furthest away from the Earth?

Tick (✓) **one** box.

Galaxy **A** ☐

Galaxy **B** ☐

Galaxy **C** ☐

(1)

(f) New scientific observations indicate that many galaxies rotate too quickly for the known mass of the stars they contain.

Why is it important that new scientific observations are peer reviewed?

Tick (✓) **one** box.

To check the observations are correct ☐

To identify control variables ☐

To provide more proof ☐

(1)

(Total 8 marks)