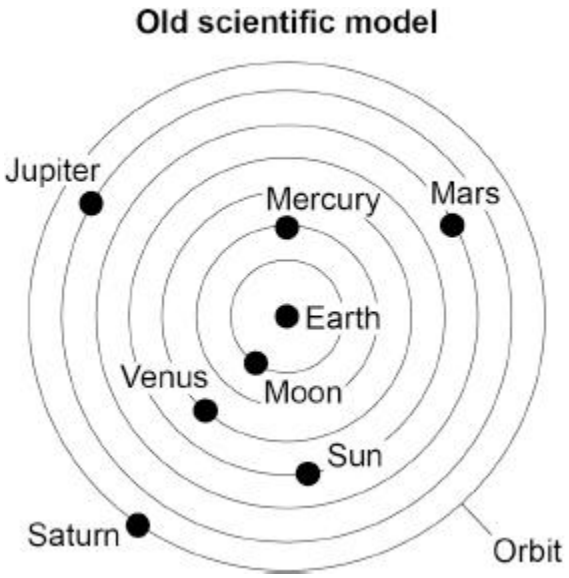
Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

Figure 1 shows an old scientific model of the solar system that has now been replaced.

Figure 1



(a) Which statement is a reason for replacing an old scientific model with a newer scientific model?

Tick (✓) **one** box.

The old model cannot explain new observations.	☐
The old model has been used by scientists for a long time.	☐
The old model is too simple.	☐

(1)

(b) Compare the model of the solar system used now with the old model of the solar system shown in **Figure 1**.

_____

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(4)

The table below shows data about four planets.

Planet	**Mean distance from the Sun in millions of kilometres**	**Time taken for one orbit in Earth years**
Mercury	58	0.25
Venus	108	0.60
Earth	150	1.00
Mars	228	1.90

(c) How does the time taken for one orbit change as the mean distance from the Sun increases?

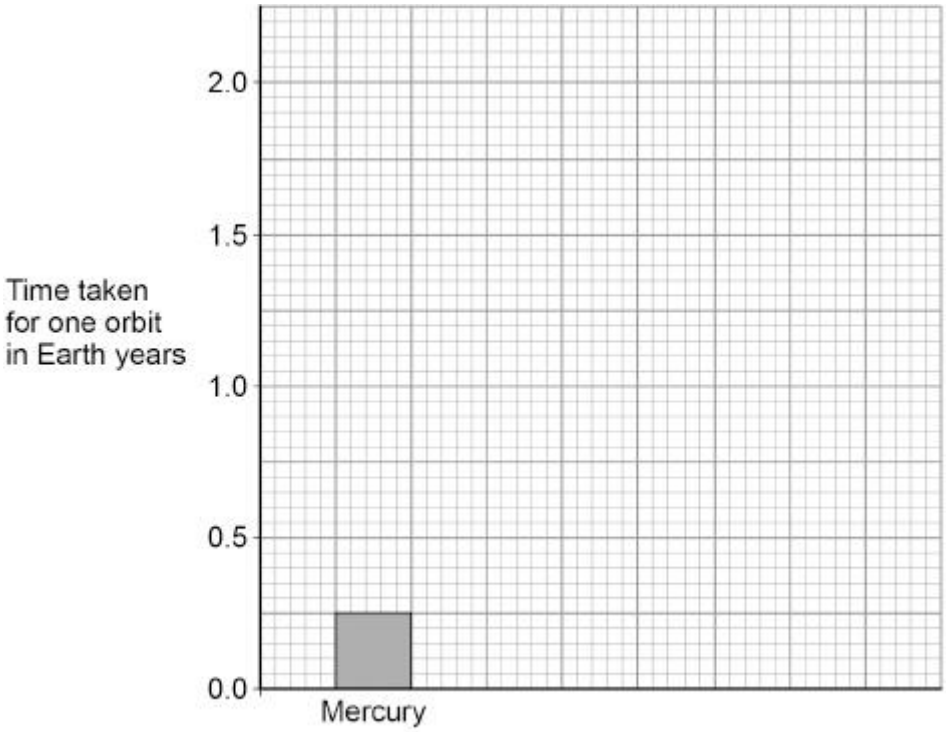
_____

_____

(1)

(d) The bar chart in **Figure 2** shows some of the data from the table above.

Figure 2



Complete the bar chart.

Use data from the table above.

(2)

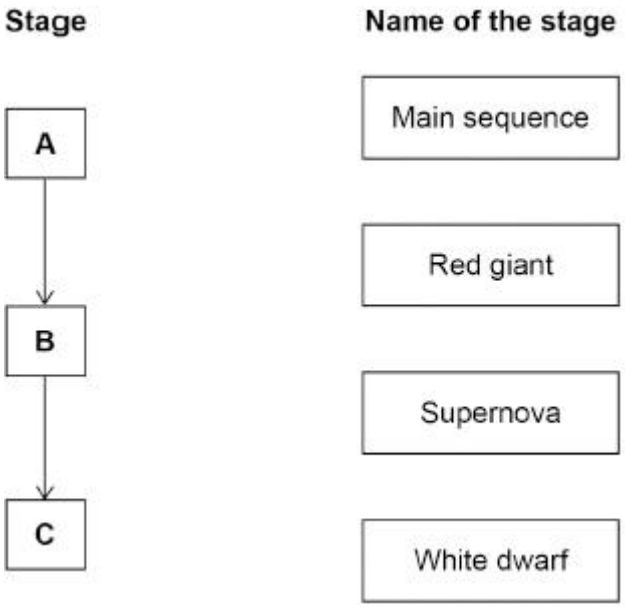
(e) All stars have a life cycle.

A, **B** and **C** in **Figure 3** represent three stages in the life cycle of the Sun.

The stages are in the correct order.

Draw **one** line from each stage to the name of the stage.

Figure 3



(2)

(f) Stars act like black bodies.

Which statement is true for perfect black bodies?

Tick (✓) **one** box.

They are good reflectors of radiation. ☐

They are the best emitters of radiation. ☐

They easily transmit radiation. ☐

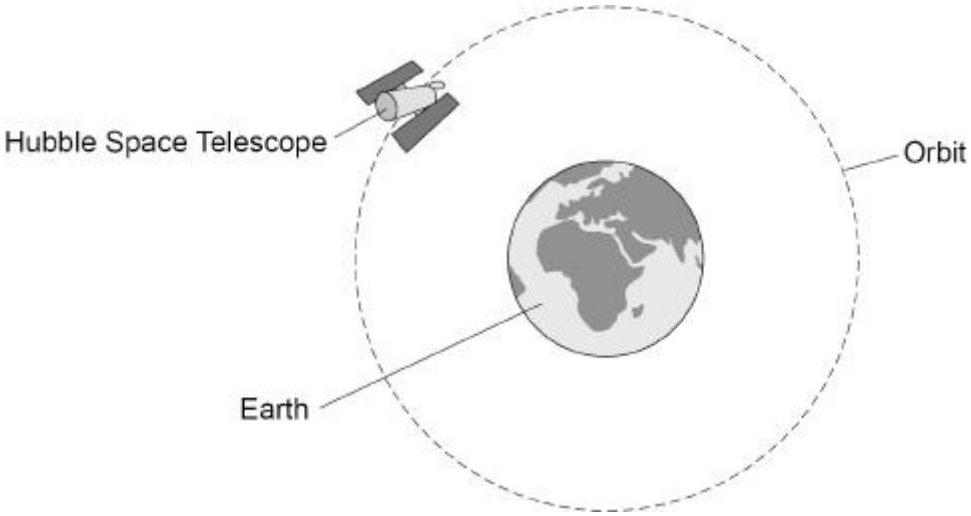
(1)

(Total 11 marks)

Q2.

Figure 1 shows the Hubble Space Telescope orbiting the Earth.

Figure 1



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

Tick (✓) **one** box.

A comet ☐

A satellite ☐

A star ☐

(1)

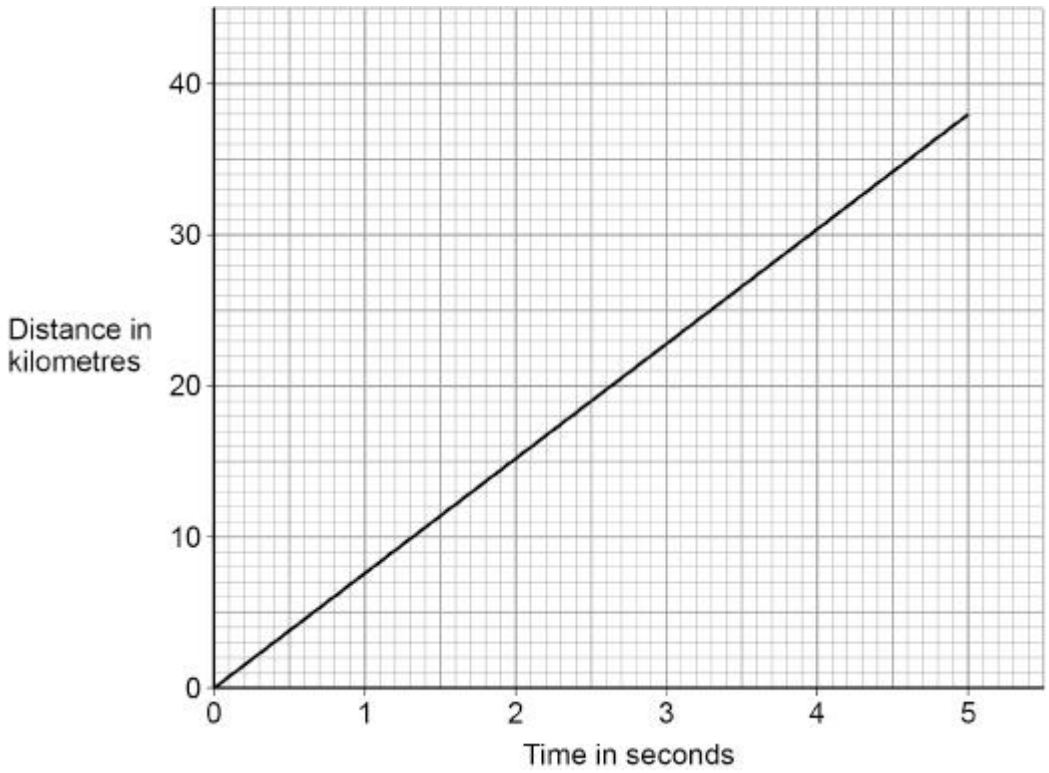
(b) The Earth exerts a gravitational force on the Hubble Space Telescope.

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

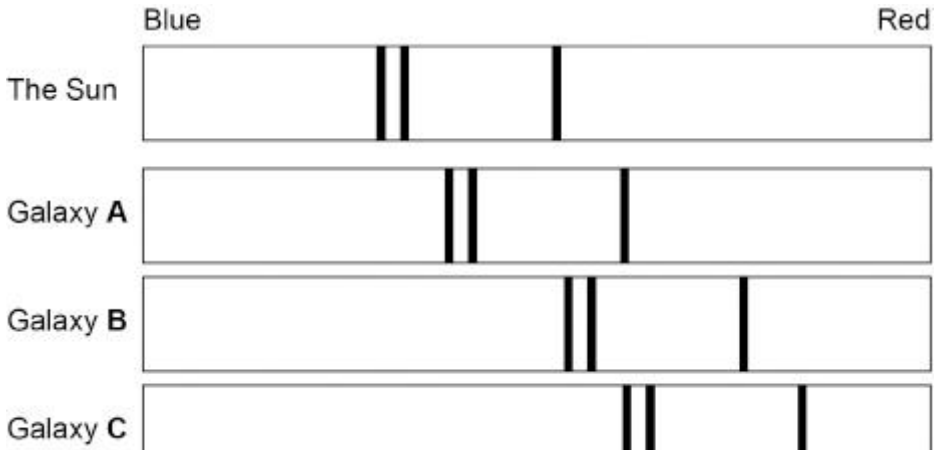
(3)

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)