Earth & The Solar System

Question Paper

Course	CIE IGCSE Physics
Section	6. Space Physics
Topic	Earth & The Solar System
Difficulty	Easy

Time Allowed 60

Score /47

Percentage /100

Question 1a

The appearance of the Moon from Earth can be explained by the relative motion of the Moon and the Earth.

Explain why the Moon rises and sets.

[1 mark]

Question 1b

The Moon is said to undergo a lunar cycle.

(i) State how much time each lunar cycle takes to complete.

[1]

(ii) Explain why the Moon has phases which are seen throughout the lunar cycle.

[3]

[4 marks]

Question 1c

Observers on Earth always see the same side of the Moon.

Explain why we never see the far side of the Moon when looking from Earth.

[2 marks]

Question 2a

Complete the description of the Earth by filling in the blanks using words from the list below.

You may use words more than once, or not at all.

- The Earth is a rocky planet following an _____ orbit around the Sun.
- It rotates on its _____, which is tilted at an angle of approximately 23.4° from the _____.
- The Earth takes approximately 24 _____ to complete one full rotation, causing the _____ daily motion of the Sun rising and setting.
- Rotation of the Earth on its axis is therefore responsible for the _____ cycle of day and night.

apparent	**hours**
axis	**periodic**
circular	**real**
elliptical	**vertical**
horizontal	

[6 marks]

Question 2b

Fig. 1 shows the Earth orbiting the Sun.

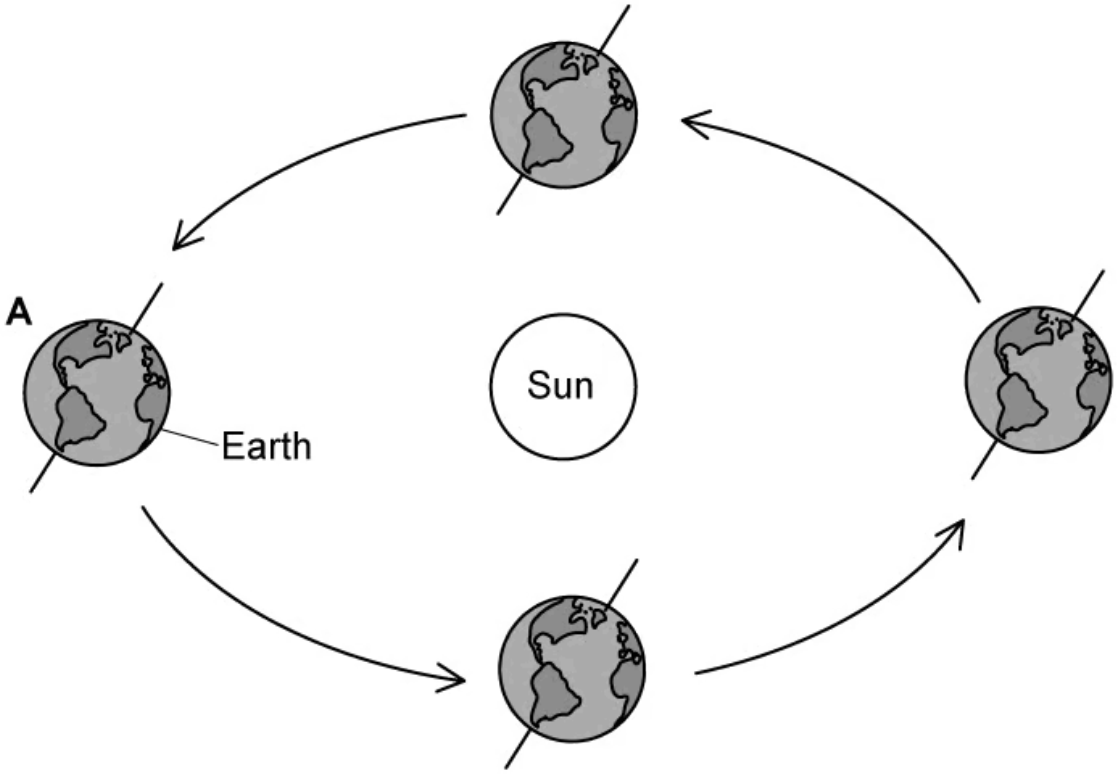

Fig. 1

Explain why it is summer in the northern hemisphere at position A.

[1 mark]

Question 2c

Complete the description of the Moon by filling in the blanks using words from the list below.

You may use words more than once, or not at all.

- The Moon is a natural _____ of the Earth which travels in a roughly _____ orbit.
- The _____ of the Moon's orbit is approximately 28 _____.
- The Moon revolves around its own axis with the same _____ as its orbit so always has the same side facing the Earth.
- The Moon shines with _____ light from the _____, it does not produce its own light

circular	**period**
days	**planet**
Earth	**reflected**
elliptical	**satellite**
hours	**Sun**

[7 marks]

Question 2d

Fig. 2 shows the phases of the Moon.

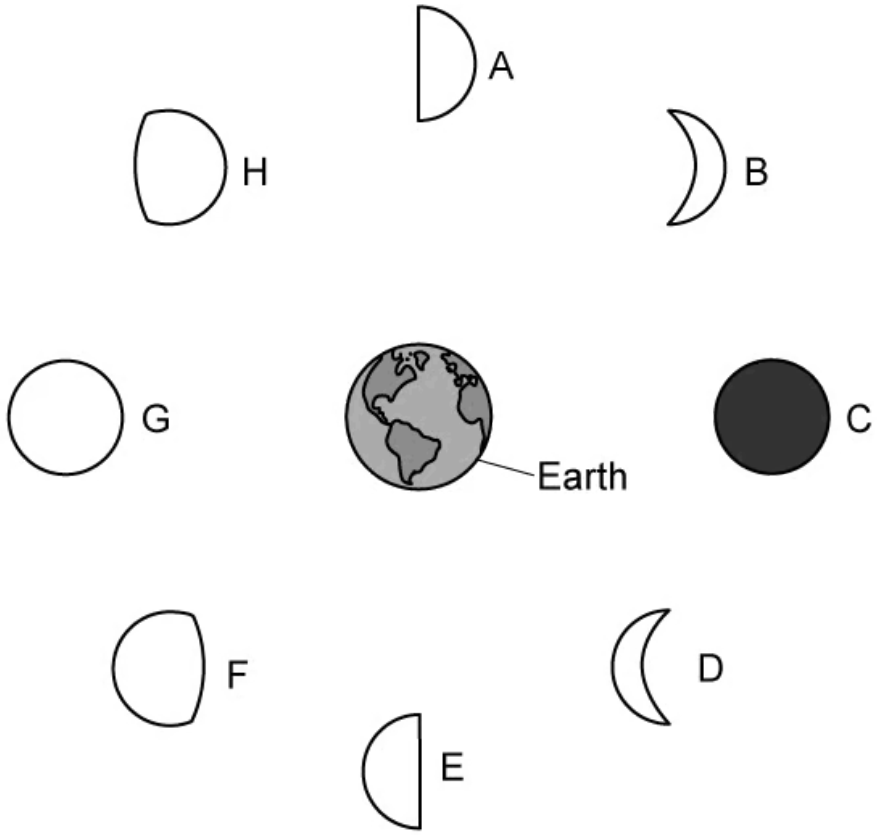

Fig. 2

Using the labels A - H, identify the following phases.

(i) Full moon.

[1]

(ii) New moon.

[1]

[1 mark]

Question 3a

Extended tier only

State the definition of 'orbital period'.

[2 marks]

Question 3b

Extended tier only

State the equation needed to calculate average orbital speed, defining any variables.

[2 marks]

Question 3c

Extended tier only

A satellite moves in a circular orbit.

Its distance above the Earth's surface is 600 km and the radius of the Earth is 6400 km.

The orbital period of the satellite is 106 minutes.

(i) Determine the radius of the orbit, stating your answer in metres.

[2]

(ii) Convert the orbital period to S.I. units.

[1]

[3 marks]

Question 3d

Extended tier only

Use your answers to part (c) to calculate the orbital speed of the satellite.

[2 marks]

Question 4a

For each description identify the body in the Solar System which is being described.

(i) The fourth planet from the Sun.

[1]

(ii) A dwarf planet beyond the orbit of Neptune.

[1]

(iii) A natural satellite orbiting a planet.

[1]

[3 marks]

Question 4b

State the location of the asteroid belt.

[1 mark]

Question 4c

The inner four planets of the Solar System are described as being small and rocky.

State the two words most commonly used to describe the outer four planets.

[2 marks]

Question 4d

State the three factors that form the basis of the accretion model for the formation of the Solar System.

[3 marks]

Question 5a

Extended tier only

Orbits are considered to be either approximately circular or elliptical.

State the position of the body which is being orbited for

(i) an approximately circular orbit

[1]

(ii) an elliptical orbit

[1]

[2 marks]

Question 5b

Name the force which keeps satellites in orbit.

[1 mark]

Question 5c

Extended tier only

The strength of the Sun's gravitational field and the orbital speeds of the planets are affected by the distance from the Sun.

For each property state the change as the distance from the Sun increases.

(i) Gravitational field strength

[1]

(ii) Orbital speed

[1]

[2 marks]

Question 5d

Extended tier only

The table in Fig. 1 shows data for three planets orbiting the same star.

Planet	Orbital Speed / km/s	Orbital period / days
Artemis	35.0	120
Hecate	67.4	58
Medea	24.1	231

Fig. 1

(i) Identify the planet which is closest to the star

[1]

(ii) State the reason for your choice

[1]

[2 marks]