

**Astronomy**  
**Standard level**  
**Paper 1**

Thursday 27 April 2017 (afternoon)

Candidate session number

45 minutes

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**Instructions to candidates**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- A clean copy of the astronomy data booklet is required for this examination paper.
- The maximum mark for this examination paper is **[30 marks]**.



Answer **all** questions. Write your answers in the boxes provided.

**The Stars**

1. Define the following terms. [2]

Brown Dwarf: .....

.....

Luminosity: .....

.....

2. State an example of a short period comet with an orbit extending well beyond the orbit of Jupiter and state from where it is felt the majority of such comets originate. [2]

Comet name: .....

Origin: .....

3. With reference to Kepler's third law, determine the orbital period of the planet Neptune (in Earth years), given that its orbital distance is 30.0AU. [3]

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4. Outline how sunspots indicate the activity of the Sun. [1]

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**The Planets**

5. Explain what is meant by the term the enhanced greenhouse effect. [2]

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6. Distinguish between a meteor and a meteorite. [2]

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7. Outline how the number of Hadley cells in an atmosphere is thought to be affected by the planetary spin. [2]

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8. State the name of the object in the solar system which is thought to be the most volcanically active. [1]

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**Galaxies**

9. Using the Hubble classification for naming galaxies, suggest which **two** types of galaxy are shown below. [2]

**Figure 1: Two different types of galaxy.**



M59



NGC 4565

[Source: <http://apod.nasa.gov>]

M59: .....

NGC 4565: .....

10. State **two** of the kinds of particles that can be found in cosmic rays. [2]

Particle 1: .....

Particle 2: .....



11. Explain why there are very few population I stars in the galactic halo of the Milky Way. [2]

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12. Define the following terms. [2]

Redshift: .....

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Elliptical Galaxy: .....

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**Cosmology**

- 13.** State the **three** possible geometric shapes for spacetime that are consistent with the cosmological principle. [3]

Shape 1:	.....
Shape 2:	.....
Shape 3:	.....

- 14.** State Olber’s paradox and outline how redshift helps to provide a solution. [3]

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- 15.** The “Great Wall” was discovered in 1989 by Margaret Geller and John Huchra. Outline what the “Great Wall” is. [1]

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08EP07

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08EP08