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Level 2 Earth and Space Science, 2017

91192 Demonstrate understanding of stars and planetary systems

9.30 a.m. Thursday 30 November 2017
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of stars and planetary systems.	Demonstrate in-depth understanding of stars and planetary systems.	Demonstrate comprehensive understanding of stars and planetary systems.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–15 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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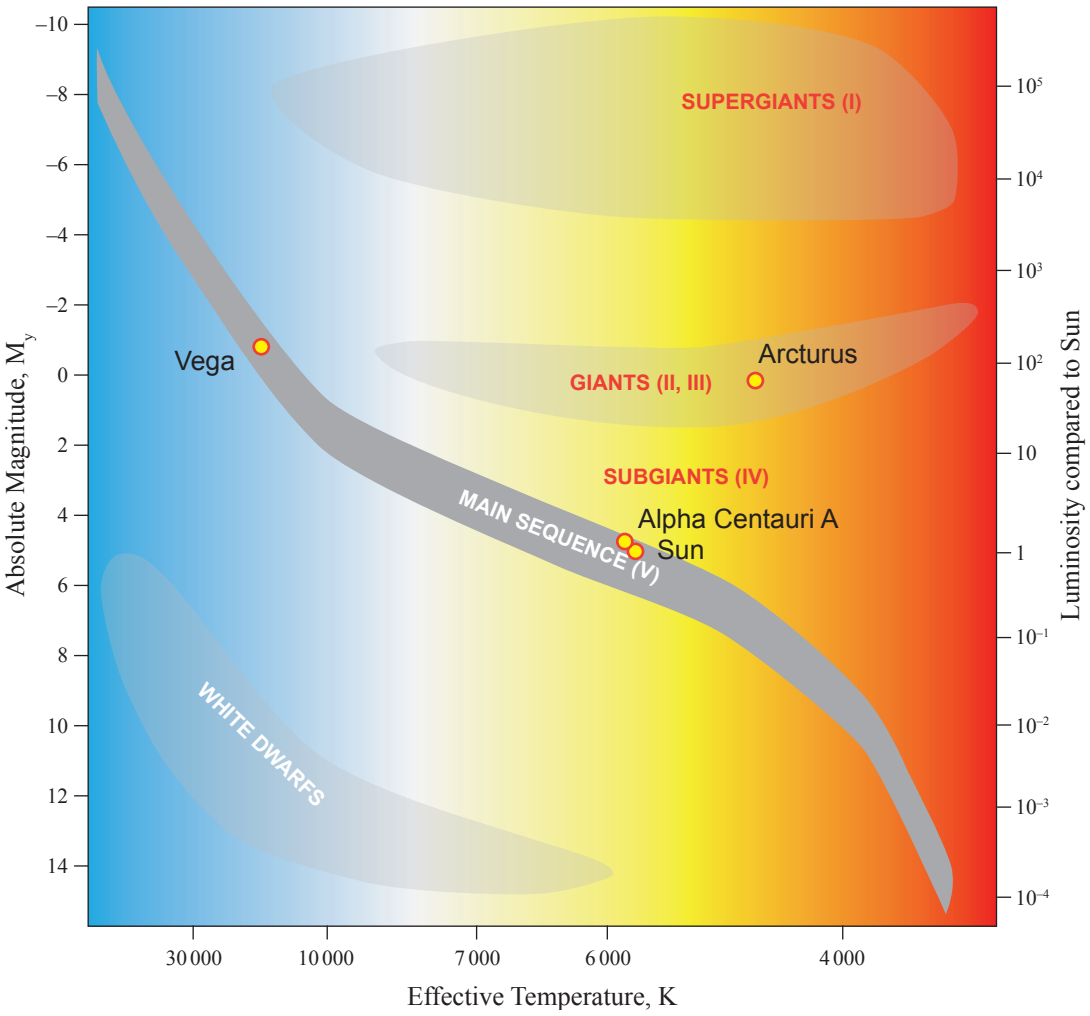
RESOURCE

Hertzsprung-Russell (HR) Diagram



Adapted from: http://astronomy.swin.edu.au/cosmos/h/hertzsprung-russell+diagram

QUESTION ONE

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Alpha Centauri A is one of our closest stars and like our Sun it is a main sequence star. Alpha Centauri A is approximately 1.1 times the size of our Sun.

Explain in detail the stages in the birth, life, and eventual death of Alpha Centauri A in terms of mass, gravity, fuel source and use, and energy changes.

You should refer to the HR diagram on page 2 in your answer, and you may draw an annotated diagram(s) in the box below in support of your answer.

More space for this answer is available on the following pages.

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QUESTION TWO

ASSESSOR'S USE ONLY

Question Two has been deliberately removed

ASSESSOR'S USE ONLY

More space for this answer is available on the following pages.

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QUESTION THREE

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www.universetoday.com/106759/second-solar-system-like-ours-discovered/

A solar system like our own has been discovered by a team of astrophysicists at the German Aerospace Centre. Seven planets (labelled b – h above) orbit the star KOI-351 (yellow circle above). They are arranged in a similar fashion (shown above) to the eight planets in our Solar System with small rocky planets close to their 'Sun' and larger gas giant planets further out from their 'Sun'.

How did this solar system of small rocky inner planets and larger gas giant planets form around this star?

In your answer you should include:

- stages in the formation of planets
- composition of inner and outer planets
- factors that affect planet formation.

You may draw an annotated diagram in the box on the opposite page to support your answer.

ASSESSOR'S USE ONLY

More space for this answer is available on the following pages.

ASSESSOR'S USE ONLY

ASSESSOR'S USE ONLY

Extra paper if required.
Write the question number(s) if applicable.

QUESTION NUMBER

ASSESSOR'S USE ONLY

Extra paper if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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