

**YEAR: 10**

**SUBJECT: Earth and Space**

**TEST: Earth and Space Topic Test**

**TIME: 55 mins**

**QUESTIONS: Part A: Multiple Choice Questions (12 marks)**

**Part B: Short Answer Questions (25 marks)**

**Part C: Extended Answer Questions (9 marks)**

**TOTAL MARKS: 46 marks**

**DO NOT WRITE ON OR MARK THIS PAPER**

**Part A: Multiple Choice Questions (1mark each)**

**Answer this section on the separate multiple – choice answer sheet**

1. The most widely accepted theory that explains where our universe came from is
2. The Infinite and Steady State theory.
3. The Atomic theory.
4. The Big Bang theory.
5. The Global theory.
6. Hubble observed that galaxies are
7. Moving toward us.
8. Expanding.
9. Moving away from us.
10. Standing still.
11. What is CMBR?
12. The first primordial elements.
13. Red shifted galaxies.
14. Leftover heat from the Big Bang.
15. The shape of the universe.
16. What was the force that allowed galaxies to form in the early universe?
    1. Background radiation
    2. Anti-matter collisions
    3. Gravity
    4. Weak nuclear force
17. The Biosphere depends on which three other spheres.
18. Thermosphere, hydrosphere and atmosphere.
19. Lithosphere, hydrosphere and mesosphere.
20. Lithosphere, mesosphere and atmosphere.
21. Lithosphere, hydrosphere and atmosphere.
22. Most of the water that gets into the atmosphere comes from large bodies of water on Earth. This water gets into the atmosphere because of:
23. Precipitation.
24. Transportation.
25. Evaporation.
26. Transpiration.
27. Identify the best description of what global warming is.
28. Periods of global warming occur between periods of glaciation.
29. Greenhouse gases in the atmosphere cause global warming.
30. Global warming began after the Industrial Revolution.
31. During periods of global warming sea levels fall exposing more land.
32. What would be the effect of removing all the carbon dioxide gas from the atmosphere?
33. Life on Earth would be safer as carbon dioxide is a dangerous greenhouse gas.
34. Life on Earth would be destroyed as carbon dioxide is necessary for photosynthesis to trap heat.
35. The Earth’s temperature would increase and life on Earth would be destroyed.
36. There would be no effect on life on Earth.
37. Which statement best describes how Earth’s oceans transfer heat around the globe?
38. The transfer of heat energy across open space.
39. The ocean currents move the heat around, from the tropics to the higher latitudes.
40. The transfer of heat energy by movement of water or air in a circular motion.
41. None of the above.
42. Global warming affects sea levels. Which of these is a likely consequence if the trend of global warming continues in coming decades?
43. Melting glaciers will cause flash flooding in mountainous regions.
44. Melting glaciers will cause flooding of coastal towns and cities.
45. Evaporation will cause sea levels to drop enlarging coastal areas.
46. Evaporation will cause the formation of U-shaped valleys.
47. Other than melting land-based ice sheets, which of these factors has made the largest contribution to the rise in sea level over the past 100 years?
48. Warming of ocean surface waters.
49. Melting sea ice.
50. Increased river runoff.
51. None of the above.
52. Which of these is the greatest threat to the survival of an ecosystem?
53. Competition among some consumer populations.
54. Less organisms at higher levels of the food web.
55. A shrinking variety of animal and plant species.
56. Predator prey population cycles.



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**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
Form \_\_\_\_\_\_\_\_\_\_\_\_**

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**QUESTIONS: Part A: Multiple Choice Questions (12 marks)**

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**Part C: Extended Answer Questions (9 marks)**

**TOTAL MARKS: 46 marks**

**Part A: Multiple Choice Answers (1mark each)**

Put a cross (X) through the correct answer.

**1** a b X d

**2** a b X d

**3** a b X d

**4** a b X d

**5** a b c X

**6** a b X d

**7** a X c d

**8** a X c d

**9** a X c d

**10** a X c d

**11** X b c d

**12** a b X d

Part A: Part B: Part C:

Multiple Choice Short Answer Extended Answer Total

/9

/12

/25

/46

**Part B: Short Answer Questions**

1. Fill in the missing words to complete the sentences below. (3 marks)

½ mark each

fourteen waves expansion universe away universe

Steady state theory: a theory that the universe has always existed in the form

that it is in today. Doppler effect: the expansion or compression of waves due to the motion

of the object making the waves. Almost all galaxies in the universe are moving away

from the Milky Way galaxy. If the universe is expanding then it is reasonable to assume that at some

point all the matter in the universe was condensed into one point. The discovery

of this background radiation as well as Hubble’s demonstration of the expansion

of the universe that convinced most scientists to accept the Big Bang theory. Once the rate of

expansion of the universe is accurately measured it is possible to predict what occurred in the

past. Astronomers currently estimate that the Big Bang occurred just under fourteen billion

years ago and a rough outline of the history of the universe.

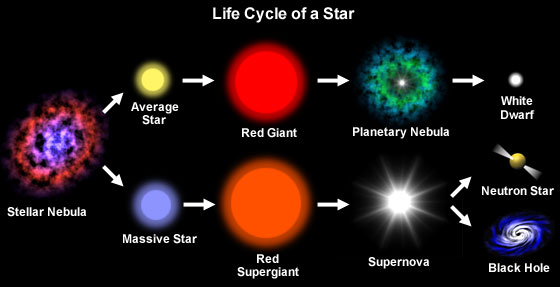
1. State **two** pieces of **evidence** that support the Big Bang theory. (2 marks)

Red shift (1), Cosmic microwave background radiation (1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Explain why the light from most galaxies that we see from Earth is redshifted. (2 marks)

When an object moves away from us(1/2), the light is shifted to the red end of the spectrum (1/2), as its wavelengths get longer (1). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. There are many steps involved in a star’s evolution, from its formation to its death. **Draw** a **labelled** diagram to show the life cycle of an average star. (3 marks)



Correct diagram (1)

Labels (2): Nebula, average star, red giant, planetary nebula, white dwarf

-1/2 for missing labels

1. **Define** the following terms: (3 marks)

Global warming

Current rise in the average temperature (1/2) of Earth’s air and oceans (1/2 must say both to get rest of mark). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Permafrost

A thick subsurface layer of soil (1/2) that remains below freezing point (1/2) throughout the year.

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Biodiversity

The variety of organisms (plant & animal) (1/2) in the world or in a particular habitat (1/2).

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1. Why is carbon important to living things? (1 mark)

Living things need carbon to live, grow and reproduce. It is an important component of organisms.

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1. **Name two** human activities that are putting more carbon, in the form of carbon dioxide, into the atmosphere and **describe** how these activities affect the carbon cycle. (2 marks)

Transportation = Burning of fossil fuels releases carbon dioxides.

Deforestation = Trees absorb and remove carbon dioxide emissions from the air. Cutting them down stops that process.

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1. **List** two factors that affect the world’s climate. (1 mark)

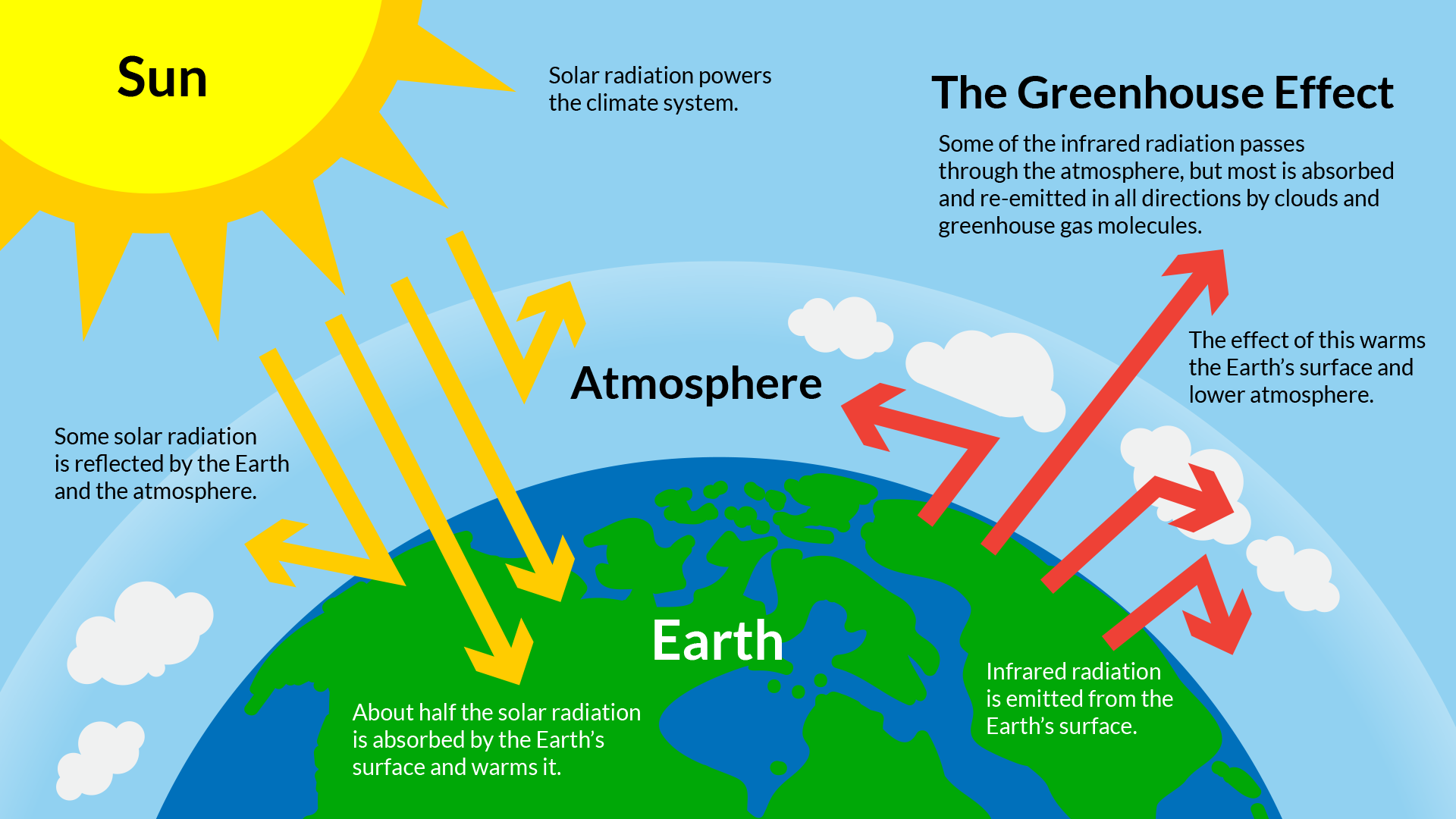
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Atmospheric circulation (1/2)

Ocean currents (1/2)

1. **Draw** and **label** to demonstrate how the greenhouse effect influences conditions on Earth.

(3 marks)



Labels (3): Sun, Earth, atmosphere, solar radiation reflected and absorbed, infrared radiation emitted, the infrared radiation passes through the atmosphere or absorbed

Any of the 8 labels max 3 marks- ½ mark each

12. Give three ways that show evidence for past changes in climate. (3 marks)

Increases in global average air and ocean temperatures (1)

Widespread melting of snow and ice (1)

Rising global average sea level (1)

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14. Explain how currently occurring changes to permafrost and sea ice can influence climate.

(2 marks)

When permafrost warms and thaws, it releases carbon dioxide and methane (any one even greenhouse gases) into the atmosphere (1).

When warming temperatures gradually melt sea iceover time, fewer bright surfaces are available toreflect sunlight back into the atmosphere (1).

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**Part C: Extended Answers**

1. Recent modelling of climate change predicts that the average temperature of the warmest month in the Australian Alps will be greater than 10 0C. This means that trees will be able to expand up into the area now occupied by alpine vegetation. Whether trees expand their range into an area depends on dispersal of the seeds to these new areas, and suitable growing conditions that allow the seedlings to grow and eventually produce seeds themselves. Even where trees do not expand their range, woody shrubs will move in. The leaves of these shrubs will shade the herbs and grasses of the alpine communities and prevent their growth. The result will be a loss in biodiversity.

E**xplain** how increasing temperatures could cause a reduction in biodiversity worldwide (2 marks) and how this will affect global systems (4 marks) (lithosphere, hydrosphere and atmosphere). (total 6 marks)

Example

Greenhouse gases, such as carbon dioxide, absorb heat from sunlight, preventing it from escaping back into space. As the level of greenhouse gases rises, so will temperatures (1). The rapid severity of this change will directly affect ecosystems and biodiversity (1).

Rising temperatures already affect the world's polar regions. Diminishing ice packs reduce the habitats of polar bears, penguins, puffins, and other Arctic creatures (1). As the ice melts, it increases the sea level, which will affect and perhaps destroy ecosystems on coastlines (1).

Rising sea levels will also cause changes to ocean temperatures and perhaps even currents. Such changes would have a strong impact on zooplankton, an essential part of the food chain in the ocean (1). Shifts in where plankton live and how big the size of their populations could upset the biodiversity in the Earth's waters. Whales, especially, could bear the brunt of this, as many whale species require mass amounts of plankton to survive (1).

2. **Explain** one type of evidence for the Big Bang theory that you believe is the **most important** and **explain** why. (3 marks)

Example

The cosmic microwave background (CMB) is thought to be leftover radiation from the Big Bang, or the time when the universe began (1). As the theory goes, when the universe was born it underwent a rapid inflation and expansion (1).

It is an **important** source of data on the early universe because it is the oldest electromagnetic radiation in the universe, dating to the epoch of recombination (1).

END OF TEST