

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

Read the passage.

In the SolarSystem, the inner planets, such as the Earth, contain elements which are eavierthan the elements hydrogen and helium.

Our star,the Sun, is a medium sized star. If a star is much more massive than the Sunit will eventually swell into a red giant, start to contract, continue tocontract and finally explode.

- (a) What is the explosion called?

(1)

- (b) Explain why scientists believe that the Solar System was formed from the material produced when earlier stars exploded.

(3)

(Total 4 marks)

Q2.

- (a) Satellites fitted with various telescopes orbit the Earth. These telescopes detect different types of electromagnetic radiation.

Why are telescopes that detect different types of electromagnetic waves used to observe the Universe?

(1)

- (b) In 2005 a space telescope detected a star that exploded 13 billion years ago. The light from the star shows the biggest *red-shift* ever measured.

- (i) What is *red-shift*?

(1)

- (ii) What does the measurement of its red-shift tell scientists about this star?

(1)

- (c) Red-shift provides evidence for the 'big bang' theory.

- (i) Describe the 'big bang' theory.

(2)

- (ii) Suggest what scientists should do if new evidence were found that did not support the 'big bang' theory.

(1)

(Total 6 marks)

Q3.

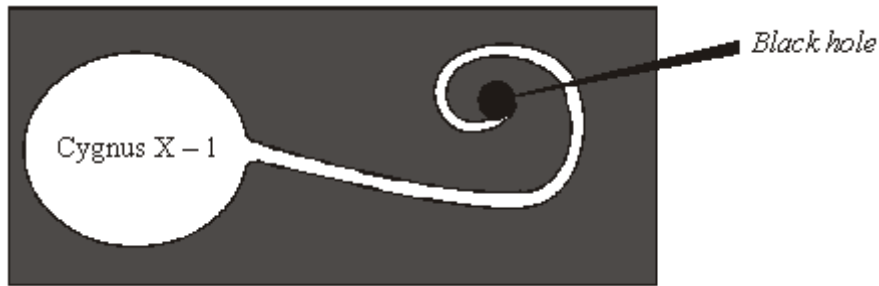
- (a) Explain how stars produce energy.

(2)

- (b) What evidence is there to suggest that the Sun was formed from the material produced when an earlier star exploded?

(1)

- (c) It is thought that gases from the massive star Cygnus X-1 are spiralling into a black hole.



- (i) Explain what is meant by the term *black hole*.

(2)

- (ii) What is produced as the gases from a star spiral into a black hole?

(1)

(Total 6 marks)

Q4.

- (a) The light spectrum from a distant galaxy shows a red shift.

What is meant by *red shift* and what does it tell us about distant galaxies?

(2)

- (b) What name is given to the theory that the Universe started with a massive explosion?

(1)

(Total 3 marks)