

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Q1.

Stars go through a life cycle. About 90 % of all stars are in the 'main sequence' period of the life cycle.

- (a) Stars are stable during the 'main sequence' period of the life cycle.

Why?

(1)

- (b) The table gives an estimated time for the number of years that three stars, X, Y and Z, will be in the 'main sequence' period of their life cycle.

Star	Relative mass of the star compared to the Sun	Estimated 'main sequence' period in millions of years
X	0.1	4 000 000
Y	1.0	9 000
Z	40.0	200

- (i) This data suggests that there is a pattern linking the mass of a star and the number of years the star is in the 'main sequence' period of its life cycle.

What is the pattern suggested by the data?

(1)

- (ii) Scientists cannot give the exact number of years a star will be in the 'main sequence' period.

Suggest why.

(1)

(iii) Nuclear fusion is the process by which energy is released in stars.

Which **one** of the following can be concluded from the data in the table?

Draw a ring around the correct answer in the box to complete the sentence.

The rate of nuclear fusion in a large star is

faster than

the same as

slower than

in a small star.

Explain the reason for your answer.

(3)

- (c) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

Describe what happens to a star **much bigger** than the Sun, once the star reaches the end of the 'main sequence' period of its life cycle.

Your answer should include the names of the stages the star passes through.

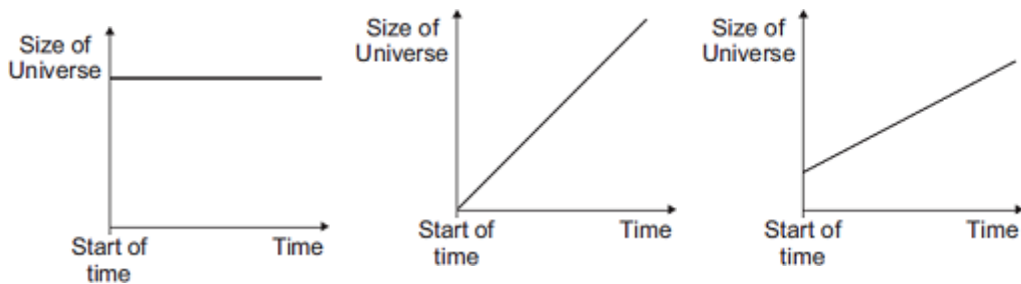
(6)

(Total 12 marks)

Q2.

The 'big bang' theory is one theory explaining the origin of the Universe.

- (a) The graphs **X**, **Y** and **Z**, show how the size of the Universe may have changed with time.



Which graph would the 'big bang' theory suggest is correct?

Write your answer, **X**, **Y** or **Z**, in the box.

Explain the reason for your answer.

(3)

- (b) In 1948, an alternative to the 'big bang' theory, called the 'steady state' theory, was developed. The 'steady state' theory suggested that the Universe, although expanding, has always existed without a beginning in time.

- (i) Complete the following sentence by drawing a ring around the correct line in the box.

The measurement of red-shift in the light from distant galaxies provides evidence

to support

- only the 'big bang' theory.
- only the 'steady state' theory.
- both the 'big bang' and 'steady state' theories.

(1)

- (ii) In 1965, scientists rejected the 'steady state' theory in favour of the 'big bang' theory.

Suggest what might cause scientists to stop supporting one theory and to start supporting an alternative theory.

(1)

(Total 5 marks)