



Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 29

1 Key words**[4]**

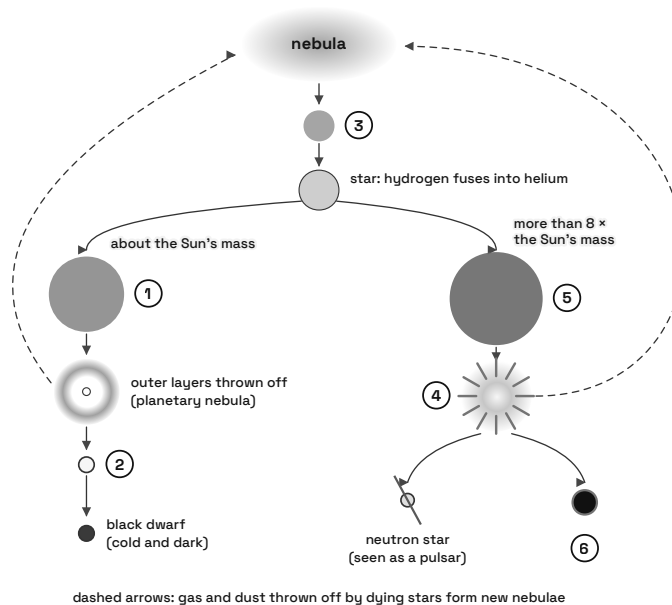
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

astronomical units **Big Bang** conservation of energy expanding gravity hydrogen
light-years nebula pulsar surface temperature

Stars are born in a _____, a giant cloud of gas and dust made mostly of _____. A star's color shows its _____: blue stars are the hottest and red ones the coolest. The universe began with the _____ about 13.8 billion years ago, and it is still _____. Distances within the Solar System are measured in _____, and distances between stars and galaxies in _____. Energy can neither be created nor destroyed, only changed from one form to another: this is the principle of _____.

2 Label the diagram**[3]**

The flowchart shows the life cycle of stars. Name the stages numbered 1 to 6. Each carries 0.5 mark.



1. _____

2. _____

3. _____

4. _____

5. _____

6. _____



[5]

Choose the correct option for each of the following questions.

- i. Which is the main element found in a nebula? [1]
 - a. helium
 - b. carbon
 - c. nitrogen
 - d. hydrogen
- ii. What is the huge explosion at the death of a massive star called? [1]
 - a. pulsar
 - b. neutron star
 - c. supernova
 - d. black hole
- iii. Which is the correct order in the life cycle of a star? [1]
 - a. nebula → protostar → star → red giant → supernova → black dwarf
 - b. nebula → protostar → star → supernova → red giant → black hole
 - c. nebula → protostar → star → red supergiant → supernova → black hole
 - d. nebula → protostar → star → red supergiant → supernova → white dwarf
- iv. Which of these is a scientific fact about the universe? [1]
 - a. The universe expands only up to a certain limit.
 - b. All the matter and energy of the universe came from one common, extremely dense beginning.
 - c. The amount of energy in the universe keeps changing.
 - d. The amount of energy decreases when matter is destroyed.
- v. Rigel, in Orion, is bluish white. Betelgeuse, also in Orion, is reddish. Which is hotter at its surface? [1]
 - a. Rigel
 - b. Betelgeuse
 - c. They are equally hot
 - d. You can't tell from color

[3]

Write very short answers to the following questions.

- a. What is a black hole? [1]
-
-
- b. What is a light-year? [1]
-
-
- c. Name the organization in Nepal that led the country's first satellite project. [1]



[6]

Write short answers to the following questions.

- a. Write any two differences between a nova and a supernova.

[2]

- b.** Give a reason: a nebula is also called a stellar nursery.

[2]

- c. Give a reason: Jupiter, the giant gas planet of the Solar System, is also called a failed star.

[2]

6 Long answer

[4]

Write a long answer to the following question.

Explain how the Sun will die after its fuel runs out.

[illegible]

7 Numerical problem

[2]

Solve the following problem. Show your working.

Jupiter is about 5.2 AU from the Sun. How far is that in meters? How long does sunlight take to reach Jupiter? (1 AU = 1.5×10^{11} m; speed of light = 3×10^8 m/s)

[illegible]

Answer:



8 Think

[2]

Think, then answer.

The Big Bang made only hydrogen and helium, yet there is iron in your blood. Where was that iron made, and how did it reach the Earth?

9 Activity: Where do matter and energy go? (Activity 12.2)

(not marked)

Complete the table: where do the matter and the energy of each go after its lifespan ends?

Object	Lifespan	Its matter goes to	Its energy goes to
a human			
wood			
a star			

Is any matter or energy lost when something's lifespan ends? Which principle does this show?

