Stars and galaxies

Workbook page 135

Q1 The following sentences explain how new elements were formed after the Big Bang in first generation stars. Rearrange the sentences so that they are in the correct order.

A Once the hydrogen was used up in the stars, helium nuclei began to fuse together to make other, heavier elements.

B Nuclear fusion reactions between hydrogen nuclei in the cores of these stars resulted in the creation of helium nuclei.

C Just seconds after the Big Bang, the Universe contained virtually nothing but hydrogen nuclei.

D Gravitational attraction brought the hydrogen nuclei together to form first generation stars.

Correct order:

C , D , B , A .

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Q2 Which one of the following statements is **not true**? Tick the appropriate box.

- [T] Many galaxies contain billions of stars.
- [T] The distance between galaxies can be millions of times the distance between stars.
- [F] Gravity is the force which keeps stars apart.
- [T] Galaxies rotate in space.
- [T] Planets are formed from the same clouds of gas and dust as stars.

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Q3 When large masses of gas and dust spiral together they form stars. When smaller masses of gas and dust spiral together they form planets.

Hint — how do stars produce heat?

Explain these two different outcomes.

When masses are pulled together under gravity they heat up and spiral faster. The more mass the higher the temperatures and pressures. It takes very high temperature and pressure to initiate fusion the process by which a star transfers energy into heat and light. If the mass is too small this ignition never occurs and you have a planet instead (Jupiter has too little mass to be a star).

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Q4 Reactions occur in the cores of stars which produce extremely large amounts of energy.

a) Name the process which releases this energy.

Nuclear fusion

b) How is most of the energy released from a star transferred to other parts of the Universe?

By radiation - it radiates energy as electromagnetic waves.

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