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Class XIth Subject Geography. Date 13.1.2021.

Ch:THE ORIGIN AND EVOLUTION OF THE EARTH

Answer the following questions in about 150 words.

Question 3(i).

Write an explanatory note on the 'Big Bang Theory'.

Answer:

The Big Bang Theory, also called as expanding universe hypothesis. Edwin Hubble in 1920 provided the evidence that the universe is expanding. The galaxies move farther as the time passes. It says that galaxies are moving away from each other. The universe appears to be growing larger.

The Big Bang Theory:-

- 1. In the beginning, all matter forming the universe existed in one place in the form of a "tiny ball" with an unimaginably small volume, infinite temperature and infinite density.**
- 2. At the Big Bang "tiny ball" exploded violently. This led to a huge expansion. It is now/ generally accepted that the event of big bang took place 13,7 billion years before the present. The expansion continues even to the present day. As it grew, some energy was converted into matter. There was particularly rapid expansion within fractions of a second after the bang. Thereafter, the expansion has slowed down. Within first three minutes from the Big Bang event, the first atom began to form.**
- 3. Within 300,000 years from the Big Bang, temperature dropped to 4,500k and gave rise to atomic matter. The universe became transparent.**
- 4. The expansion of universe means increase in space between the galaxies. An alternative to this was Hoyle's concept of steady state. It considered the universe to be roughly the same at any point of time. However, with greater evidence becoming available about the expanding universe, scientific community at present favours argument of expanding universe.**

Question 3(ii).

List the stages in the evolution of the earth and explain each stage in brief.

Answer:

The earth was mostly in a volatile state during its primordial stage. Due to gradual increase in density the temperature inside has increased. As a result the material inside started getting separated depending on their densities. This allowed heavier materials (like iron) to sink towards the centre of the earth and the lighter ones to move towards the surface. With passage of time it cooled further and solidified and condensed into a smaller size. This later led to the development of the outer surface in the form of a crust. It is through the process of differentiation that the earth forming material got separated into different layers. Starting from the surface to the central parts, we have layers like the crust, mantle, outer core and inner core. From the crust to the core, the density of the material increases.

The origin of life as a kind of chemical reaction, which first generated complex organic molecules and assembled them, This assemblage was such that they could duplicate themselves concerting inanimate matter into living substance. The record of life that existed on this planet in different periods is found in rocks in the form of fossils. The microscopic structures closely related to the present form of the blue algae have been found in geological formations much older than some 3,000 million years. It can be assumed that life began to evolve sometime 3,800 million years ago.

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