

## CBSE Test Paper 03

### Ch-7 Evolution

---

1. The process in which heritable variations enabling better survival are enabled to reproduce and leave greater number of progeny is called
  - a. Mutation
  - b. Natural selection
  - c. Genetic drift
  - d. Founder effect
2. Which one of the following is incorrect about the characteristics of protobionts (coacervates and microspheres) as envisaged in the abiogenic origin of life?
  - a. They could separate combinations of molecules from the surroundings
  - b. They could maintain an internal environment
  - c. They were partially isolated from the surrounding
  - d. They were able to reproduce
3. A baby has been born with a small tail. It is the case exhibiting
  - a. Atavism
  - b. Metamorphosis
  - c. Mutation
  - d. Retrogressive evolution
4. Which of the following are not the examples of analogous structures?
  - a. Tendril of Lathyrus and tendril of Gloriosa
  - b. Wings of bat and butterfly
  - c. Wings of bat and forelimb of cattle
  - d. Thorn and spine
5. Big bang theory try to explain
  - a. The origin of universe
  - b. The origin of human being
  - c. The origin of life on earth
  - d. The origin of earth
6. Pick out the ancestral line of Angiosperms from the list given below - Conifers, seed ferns, cycads, ferns.

- 
7. Who provided experimental support for Haldane-Oparin Hypothesis?
  8. What is common ancestor of reptiles and birds.
  9. How does an evolutionary biologist explain why a species of birds has evolved a larger beak size?
  10. How do Darwin's finches illustrate adaptive radiation?
  11. Mention the key concepts about the mechanism of biological evolution / speciation according to
    - i. de Vries and
    - ii. Darwin.
  12. Sweet potato tubers and potato tubers are the result of convergent evolution. Justify the statement.
  13. Differentiate between Darwinism and Neo-Darwinism.
  14. Explain the origin of simple organic compounds on the primitive earth.
  15. State the theory of Biogenesis. How does Miller's experiment support this theory?

---

## CBSE Test Paper 03

### Ch-7 Evolution

---

#### Answer

1. b. Natural selection, **Explanation:** Natural selection is the process whereby organisms better adapted to their environment tend to survive and produce more offspring. The theory of its action was first fully expounded by Charles Darwin, and it is now regarded as be the main process that brings about evolution.
2. a. They could separate combinations of molecules from the surroundings  
**Explanation:** Protobionts that include coacervates and microspheres are involved in origin of life from inorganic substance. Coacervate and microspheres are separate combinations of molecules from surroundings that leads to formation of first life on earth.
3. a. Atavism, **Explanation:** Atavism is the tendency to revert to ancestral type. It is a kind of evolutionary throwback, such as traits reappearing which had disappeared generation before. Baby born with small tail is a case of atavism.
4. c. Wings of bat and forelimb of cattle, **Explanation:** Analogous structure is that structure which performs similar function in spite of different origin. Wings of bat and forelimb of cattle do not perform same function and have common origin.
5. a. The origin of universe, **Explanation:** The Big Bang is a scientific theory about how the universe started, and then made the stars and galaxies we see today. It tries to explain the origin of universe. It told us about the singular large explosion unimaginable in physical term.
6. Seed ferns
7. Stanley Miller and Urey.
8. Archaeopteryx as a transitional fossil between dinosaurs and modern birds. With its blend of avian and reptilian features, it was long viewed as the earliest known bird. Discovered in 1860 in Germany, it's sometimes referred to as Urvogel, the German

word for "original bird" or "first bird."

9. Some members of the ancestral population had larger beaks than others. If larger beak size was advantageous, they would be more likely to survive and reproduce. As such, large beaked birds increased in frequency relative to small beaked birds. Species of birds having larger beaks size have been evolved to become more advantageous. If larger beak size was advantageous, they would be more likely to survive and reproduce. The larger beaked birds increased in frequency relative to smaller birds.
10. Original stock of seed eating finches migrated to different habitats, adapted to different feeding methods, by altered beak structure, evolved into different types of finches.
11.
  - i. de Vries - Mutation
  - ii. Darwin - Branching descent and natural selection.
12. Some organisms have organs which have similar function but differ anatomically. These are called analogous structures. They are the result of convergent evolution. Sweet potato tubers (underground, root modifications) and potato tubers (underground, stem modification) are both fleshy and serve the function of storage of food materials thus serving a similar function but are of different origin.

13.

<b>Darwinism</b>	<b>Modern synthetic theory (Neo Darwinism)</b>
<ul style="list-style-type: none"><li>◦ Darwinism does not talk about the reason for the appearance of variations.</li></ul>	<ul style="list-style-type: none"><li>◦ It explains the origin of various types of variations through various factors.</li></ul>
<ul style="list-style-type: none"><li>◦ According to this theory, all useful variations are inheritable.</li></ul>	<ul style="list-style-type: none"><li>◦ It believes that only those variations are inheritable which are genetic.</li></ul>

<ul style="list-style-type: none"> <li>◦ Individuals are believed to be units for evolution.</li> </ul>	<ul style="list-style-type: none"> <li>◦ Population is the unit of evolution.</li> </ul>
<ul style="list-style-type: none"> <li>◦ Natural selection operates through survival of the fittest in a population.</li> </ul>	<ul style="list-style-type: none"> <li>◦ Natural selection operates through differential reproduction.</li> </ul>
<ul style="list-style-type: none"> <li>◦ Isolation is not important in this theory.</li> </ul>	<ul style="list-style-type: none"> <li>◦ Isolation is pre-requisite for the formation of new species.</li> </ul>

14.

- i. Early earth had innumerable free atoms of all those elements, which were essential for the formation of protoplasm.
- ii. Free atoms combined to form molecules and simple inorganic compounds.
- iii. The primitive atmosphere contained gases like  $CO_2$ ,  $CO$ ,  $N$ ,  $H_2$ . The nitrogen and carbon of the atmosphere combine with metallic atoms, forming nitrides and carbides. Water vapour and metallic carbides reacted to form the first organic compounds, methane ( $CH_4$ ). Later on hydrogen cyanide was formed. Torrential rain must have dissolved away and carried with it salts and minerals, and ultimately accumulated in the form of present occurrence. Thus ancient oceanic waters contained large amounts of dissolved  $NH_3$ ,  $CH_4$ ,  $HCN$  nitrides, carbides, various gases and elements. The early compounds interacted and produced simple organic compounds such as simple sugars, nitrogenous bases, amino acids, glycerol, fatty acids, etc. under the action of external forces such as solar radiations, electrical discharges and like lightning and high energy radiations.

15. The theory of biogenesis states that life comes from pre-existing life.

Miller's Experiment:

- Stanly Miller and Urey created conditions similar to the primitive atmosphere using glass apparatus and tubes in the laboratory.
- The electric discharge was created by using electrodes in a closed flask containing methane, ammonia, hydrogen and water vapours at  $800^\circ C$ .

- The chamber containing water was heated to provide water vapour.
- He passed the mixture through a condenser. He circulated the gases continuously in this way for one week and then analysed the chemical composition of the liquid inside the apparatus. He observed a large number of simple organic compounds and some amino acids like alanine, glycine and aspartic acid. Miller proved that organic compounds were the basis of life, which supported opaline's theory.

