CBSE Test Paper 05

Ch-7 Evolution

1. Which of the following factors influence the Hardy-Weinberg equilibrium?
   i. Gene migration
   ii. Genetic drift
   iii. Mutation
   iv. Reproduction
   v. Genetic recombination
      a. Only ii, iii, and iv
      b. Only iii, iv and v
      c. Only i, ii, iii and iv
      d. Only i, ii, iii and v
2. Which of the following amino acids was not found to be synthesized in Miller's Experiment?
   a. Aspartic acid
   b. Glutamic acid
   c. Alanine
   d. Glycine
3. Links between organisms that show branching pattern of evolutionary relationships are shown by
   a. Living fossils
   b. Two fossil layers
   c. Comparative embryology
   d. Phylogenetic trees
4. The experiment to show the production of mice in 21 days from a dirty shirt placed in Contact with kernels of wheat was carried out by _____.
   a. Aristotle
   b. Jean Baptiste Van Helmont
   c. Francesco Redi
   d. Louis Pasteur
5. Hardy-Weinberg principle states that allele frequencies in a population are stable and is

a. Varies from generation to generation
b. Constant up to second generation
c. Constant from generation to generation
d. Constant for second generation

6. According to Hardy Weinberg's principle, the allele frequency of a population remains constant. How do you interpret the change of frequency of alleles in a population?

7. In which form/forms did Urey-Miller supply energy in their experiment.

8. Name the species in the blanks a and b given below ____Ramapithecus $\rightarrow$ a $\rightarrow$ b $\rightarrow$ Homo erectus ____ Homo sapiens.

9. Pick out the ancestral line of cycads from the list given below - Ferns, herbaceous lycopods, seed ferns and horsetails.

10. State the significance of coelacanth in evolution.

11. Give the composition of gases in the Miller's experiment. In what form had Miller supplied energy in his experiment?

12. How does Darwin's theory of natural selection explain the appearance of new forms of life on earth?

13. What is the study of fossils called? Mention any three points how the fossils throw light on the past.

14. Explain the following two components of Darwin's theory of natural selection.

    i. Variations

    ii. Formation of new species

15. Differentiate between Lamarckism and Darwinism.

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Answer

1. d. Only i, ii, iii and v, **Explanation:** The Hardy–Weinberg principle, also known as the Hardy–Weinberg equilibrium, model, theorem, or law, states that allele and genotype frequencies in a population will remain constant from generation to generation in the absence of other evolutionary influences.
   These influences include mutation, selection, genetic drift, gene migration, gene flow, genetic recombination and meiotic drive.
2. b. Glutamic acid, **Explanation:** The famous experiment of Urey and Miller regarding origin of life from inorganic substance produced amino acids, sugar and nitrogenous base etc. glutamic acid was not found in this experiment.
3. d. Phylogenetic trees, **Explanation:** Phylogenetic trees shows links between organisms that show branching pattern of evolutionary relationship. In this pattern, the organism that evolves earlier is shown below and further sub branching represent newly evolved organisms.
4. b. Jean Baptiste Van Helmont, **Explanation:** The first experiments to prove the spontaneous generation theory were done in the XVII century and a doctor called Jean Baptiste Van Helmont declared he had performed a unique experiment: he placed a dirty shirt together with some wheat and according to him, mice were born 21 days later.
   According to the Doctor the sweat in the shirt was the active element which gave life to the inert matter.
5. c. Constant from generation to generation, **Explanation:** The Hardy–Weinberg principle, also known as the Hardy–Weinberg equilibrium, model, theorem, or law, states that allele and genotype frequencies in a population will remain constant from generation to generation in the absence of other evolutionary influences.
6. Change of frequency of alleles in a population will result in evolution.

7. The energy was in the form of electric discharges from electrodes.
8.
    a. Australopithecus
    b. Homo habilis
9. Seed ferns
10. Coelacanth is considered as living fossil and connecting link between bony fishes and amphibians.

    The connecting links establish continuity in the series of animals by proving that one group has evolved from the other.
11. Miller included basic chemicals that were present on Earth before life began: water, methane (CH_4), ammonia (NH_3), and hydrogen (H_2). These molecules contain the most abundant elements in living cells, which are carbon, hydrogen, oxygen, and nitrogen.

    Electric sparks and heat from electric heater.
12. Variations occur in population of any species, some variations are heritable, helping the members to adapt and survive. They reproduce and nature selects such members, leading to the formation of new species, over many generations.
13. Study of fossils is called Paleontology.
    i. The rocks of early era contain less number of fossils than the rocks of later era and fossils of only simple marine invertebrates are in these rocks, which indicate that life originated in sea as simple form.
    ii. The distribution of fossils indicates that fossils became more and more complex as we proceeded from earliest to recent rocks.
    iii. On the basis of fossil study, it has been shown that the early organisms were very different from their modern forms.
14. **(i) Variations: -** There are differences among all individuals. These differences are

called variations. According to Darwin, the variations are gradual (continuous) and those, which are helpful in the adaptations of an organism towards its surroundings would be passed on to next generation, while the other disappears.

(ii) Formation of new species - Darwin considered that useful variations are transmitted to the offspring and appear more prominently in succeeding generations. After some generations these continuous and gradual variations in the possessor would be so distinct that they form a new species.

15.

Lamarckism	**Darwinism**
◦ It believes in the presence of an internal vital force in all organisms for evolution.	◦ It does not believe in the existence of any internal vital force for evolution.
◦ New needs, desires, and conscious reaction can result in modifications and even new organs development.	◦ It does not talk about the role of need or desires for development of new modifications or development in an organism.
◦ Use and disuse of organs bring about their development and degeneration respectively.	◦ An organ can develop further or degenerate only to the variations appearing in that direction.
◦ Changes in environment produce variations.	◦ Variations are already present. Changing environment selects some useful variations suitable for existing in it.
◦ It does not consider any struggle for existence.	◦ Struggle for existence is a major and important factor in this theory.
◦ It does not believe in natural selection.	◦ The theory is based on natural selection and survival of the fittest (reproductive fitness).