CHAPTER 7

Evolution

TRY YOURSELF

ANSWERS

1. Theory of chemical evolution of life states formation of diverse organic molecules from inorganic constituents. Under the conditions such as high temperature, volcanic storms and reducing atmosphere containing CH_4, NH_3 etc.

2. The Big Bang theory is the most accepted theory regarding the origin of universe. It was proposed by Abbe Lemaitre in 1931. According to this theory, a fiery explosion took place which broke the condensed matter and scattered its fragments into space at an enormous velocity making a 'big bang' sound. The universe expanded and hence the temperature came down. Hydrogen and helium formed sometime later. The gases condensed under gravitation and formed the galaxies of the present day universe.

3. Differences between convergent and divergent evolution are :

	Convergent evolution	Divergent evolution
(i)	Development of similar adaptive functional structures in unrelated groups of organisms is called convergent evolution.	Development of different functional structures from a common ancestral form is called divergent evolution.
(ii)	Analogous organs show convergent evolution. Example – Australian marsupials and placental mammals.	Homologous organs show divergent evolution. Example – Darwin's finches.

4. Wings of a butterfly and bat perform the same function of flying despite having structural dissimilarity. Thus it can be inferred that these are analogous organs and are result of convergent evolution.

5. The phrase "*Ontogeny recapitulates phylogeny*" was proposed by Ernst Haeckel. It is also called the biogenetic law. The theory states that in an organism, embryonic development and differentiation correspond to the stages of evolutionary development characteristic of the species.

6.

Lamarckism		Darwinism	
(i)	This theory states that there is an internal vital force in all organisms.	(i)	It does not believe in the internal vital force.
(ii)	It considers that new needs or desires produce new structures and change habits of the organism.	(ii)	It does not form part of Darwin's natural selection theory.

7. Pre-industrialisation period had more white-winged moths due to whitish lichens on tree trunks. During industrialisation large amount of soot and smoke deposited on tree trunks, making the trunks darker. Against the dark background, white moths could easily be preyed upon. Melanised dark moth could camouflage against dark bark and survived. Thus, it supports evolution by natural selection.

8. Artificial selection is the process of selecting genetically improved and domesticated plants and animals by man and interbred them to get individuals of desired genetic traits. If it is repeated for many generations, it produces a new breed with desired characters.

9. Differences between allopatric and sympatric speciation are:

Allopatric speciation		Sympatric speciation
(i)	It occurs in a spatially isolated population.	It occurs from a segment within a population.
(ii)	The barrier is physical.	The barrier is ecological and genetic.
(iii)	Speciation is slow.	Speciation is rapid.
(iv)	There are chances of breakdown of isolating mechanism.	Chances of breakdown of isolating mechanism are rare.

10. Frequency of A allele = All AA + ½ Aa (36 + ½ × 28) = 50%
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11. Hardy-Weinberg principle give the geneticists a tool to determine when evolution is occuring. They use this principle to calculate the straight point allele frequency and then compare it to frequencies measured at future. The amount of deviation between observed frequencies and those predicted by Hardy- Weinberg principle indicates the degree of evolutionary change.

12. The early human stock gave rise to *Australopithecus*. Raymond Dart discovered the fossil of *Australopithecus africanus* from Pliocene rocks near Tuang in Africa. It existed until about 1.5 million years ago and gave rise to *Homo habilis* 2 million years ago. Some of its characteristics are :

- Bipedal locomotion and erect posture.
- Brain capacity was about 500cc.
- Brow ridges projected over eyes.
- Lumbar curve in the vertebral coloumn.

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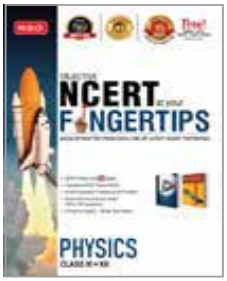

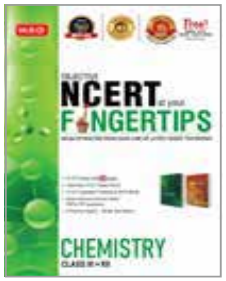

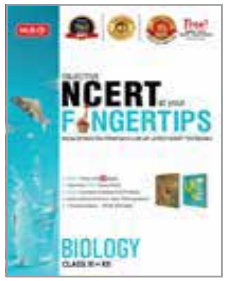

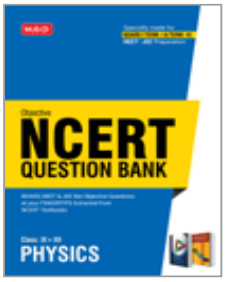

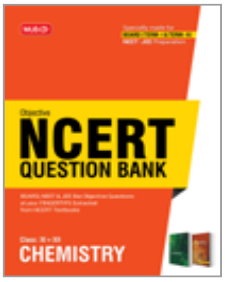

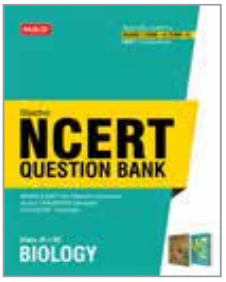

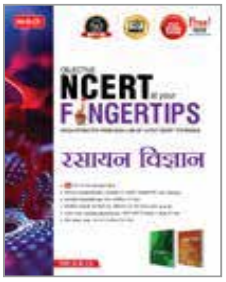

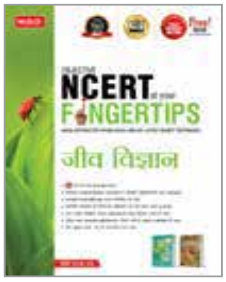

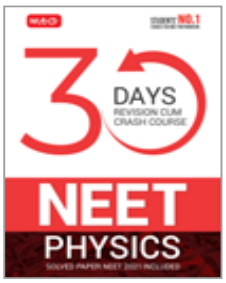

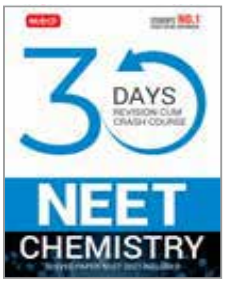

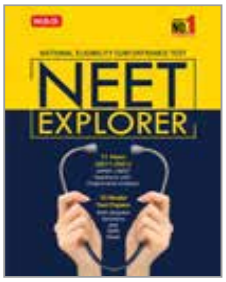

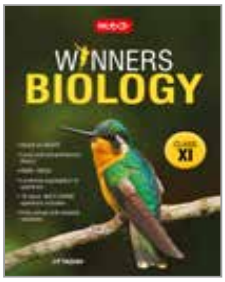

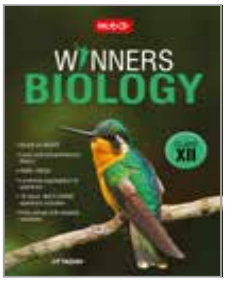

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