

DPP

DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 10

Topic :- Evolution

- 1 **(a)**
Birbal Sahni (14 November, 1891 and 10 April 1949) was an Indian palaeobotanist who studied the fossils of Indian sub-continent. He was also a geologist who took an interest in Archaeology. He founded the Birbal Sahni Institute of Palaeobotany in Lucknow, India. His greatest contributions lie in the study of botany of the plants of India. Apart from writing numerous influential papers on these topics, he also served as the President of the National Academy of Sciences, India and as the Honorary President of the International Botanical Congress, Stockholm. He died on 10 April, 1949
- 2 **(a)**
 The evolution of the peppered moths over the last two hundred years has been studied in detail. Originally, the vast majority of peppered moths had light colouration, which effectively camouflaged them against the light-coloured trees and lichens which they rested upon. However, because of widespread pollution during the Industrial Revolution in England, many of the lichens died out, and the trees that peppered moths rested on became blackened by the soot, causing most of the light-coloured moths or typical, to die off from predation. At the same time, the dark-coloured or melanic moths flourished because of their ability to hide on the darkened trees
- 3 **(b)**
 A-Frequency, B-Stable, C-Algebraic
- 4 **(a)**
Fossils provide the direct evidences of organic evolution. Fossils may be entire organisms buried in sediment or snow, small part of ancient organisms or impression, extinct organisms, ancient leaf or stem.
- 5 **(c)**
 The organs, which have similar function but different in their structure and origin are called analogous organ, *e.g.*, wings of butterfly and wings of bat and birds.
- 6 **(d)**
 Palaeontology – Study of fossils

 Cytology – Study of cell structure and function

 Herpetology – Study of reptiles and amphibians

7 (d)

Experiment Conducted by Hugo de Vries

He conducted his experiment on *oenothera lamarckiana* (evening primrose) and found several different types of plants when plant was self pollinated and its seeds were allowed to grow, majority of F₁ plants were similar to the parents but few were different. Hugo de Vries suggested from his experiments that new types of inherited characters may appear suddenly without any previous indication of their presence in the race

8 (b)

Forked tongue snakes may represents the origin of new variety of snake from the non-forked tongue snakes. If biologist is trying to find that how closely these two species are related to each other than, he/she has to locate a specimen of more distantly related snake to see it, wheater, it has a forked tongue or not

9 (a)

The first living form is named as protocell or eobiont or protobiont, which evolved into prokaryotic cell. These were originated about 3900-3500 million years ago, during precambrian era.

10 (d)

Lack of migration, low selection pressure and very less mutation leads to the stabilization of a species in which the evolution occurs very slowly

11 (b)

Darwin.

Based on observation made during a sea voyage in a sail ship called HMS Beagle round the world. Charles Darwin conclude that the existing living forms share similarities to varying degrees not only among themselves but also with the life forms that existed millions of years ago

The fitness, according to Darwin, refers ultimately and only to reproductive fitness. Hence, those who are better fit in an environment, leave more progeny than other. These, therefore will survive more and, hence are selected by nature. He called it natural selection and implied it as a mechanism of evolutions

12 (c)

Sexual selection is the type of natural selection in which the organism is selected due to high reproductive values

13 (b)

Common ancestry.

Homologous Organs The organs which have the same fundamental structure but are different in functions are called homologous organs. These organs follows the same basic plan of organization during development. But in adult condition, these organs are modified to perform different function as an adaptation to the different environment. Homologous organs are the resultant of divergent evolution

Implants homologous organs may be a those of *Bougainvillea* or a tendril of *Cucurbita*, both arising in the axillary position.

Divergent evolution is the accumulation of differences between groups which can lead to the

formation of new species. Usually, it is a result of diffusion of the same species to different and isolated environments which blocks the gene flow among the distinct populations allowing differentiated fixation of characteristics through genetic drift and natural selection. Primarily diffusion is the basis of molecular division which can be seen in some higher-level characters of the structure and function that are readily observable in organisms. For example, the vertebrate limb is one example of divergent evolution. The limb in many different species has a common origin, but has diverged somewhat in overall structure and function

14 (b)

Homology is also seen amongst the molecules. This is called molecular. For example, the proteins found in the blood of man and ape are similar. The phylogeny of an organism can be traced by using the base sequence in nucleic acids and the amino acid sequence of the proteins in related organisms

15 (c)

According to Neo – Darwinian theory, the processes that bring changes at the genetic level and are responsible for the origin of new species are **mutations, recombinations, gene, migration** (gene exchange), **genetic drift** and **natural selection**. These agents cause changes in alleles, genes, genotypic frequencies of a population and thus bring out evolution through origin of new species.

16 (b)

Theory of continuity of germplasm was proposed by **August Weismann**. He suggested that the changes occurring in germplasm are inherited by offsprings, whereas changes in somatoplasm are not transmitted to next generation.

17 (b)

Spallanzani disapproved the theory of abiogenesis (spontaneous generation)

Spallanzani's Experiment He experimented that animal and vegetable broths boiled for the several hours and soon after sealed, were never infested with microorganisms. From this experiment he concluded that, high temperature had killed all living organisms in the broths and without them life did not appear. When the broths were left exposed to air, it was soon invaded by microorganisms

18 (a)

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19 (d)

Shelled eggs and internal fertilization these are the two great changes occurred in the organism, which made them free from their water life.

These two changes are seen in reptiles, birds and amphibians. But the organism, which are still completely dependent on the water do not have these the characters

20 (d)

In evolutionary biology, adaptive radiation is a process in which the organisms diversify rapidly into a multitude of new forms, particularly when a change in the environment makes the new resources available and opens the environmental niches. Starting with a recent single ancestor, this process results in the speciation and phenotypic adaptation of an array of species exhibiting morphological and physiological traits with which they can exploit a range of divergent environments

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	A	A	B	A	C	D	D	B	A	D
Q.	11	12	13	14	15	16	17	18	19	20
A.	B	C	B	B	C	B	B	A	D	D