

DPP

DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 8

Topic :- Evolution

- 1 **(d)**
Organic means living. Evolution means change through time. Ecology is the study of organisms in their environment. Embryology is the study of developing organisms. Spontaneous generation is the theory that living things can arise from the non-living materials
- 2 **(b)**
Evolution is always considered as the appearance of new character, permanently. The genes of the new characters should also be transmitted to the offspring otherwise the changes are lost. Adaptive ability can't be consider as evolution because this ability may be temporary due to environmental changes
- 3 **(b)**
Connecting Links The organisms having the structures of two different groups are called connecting links. These explain the path of evolution.
Connecting Links Organisms are those which show characters of two different groups. They show the possible path for evolution

Some Important Connecting Links

Link	Between the Groups
<i>Xenoturbella</i>	Protozoa and Metazoa
Virus	Living and non-living
Trochophore larva	Annelida and Mollusca
Tornaria larva	Echinodermata and Chordata
<i>Sphenodon</i> (living fossil lizard)	Amphibia and Reptilia
<i>Seymouria</i>	Amphibian and Reptiles
Rickettsia	Virus and Bacteria
<i>Protopterus</i> (Lung fishes)	Bony fishes and Amphibia
<i>Proterospongia</i>	Protozoa and Porifera
<i>Peripatus</i> (walking worm)	Annelida and Arthropoda
<i>Ornithorhynchus</i>	Reptiles and

(duck billed platypus) <i>Neopilina</i>	Mammals
<i>Myxomycetes</i> <i>Latimeria</i>	Annelida and Mollusca Protista and Fungi Pisces and Amphibia
Hornworts <i>Gnetum</i>	Protista and Bryophytes Gymnosperms and Angiosperms
<i>Euglena</i> <i>Echidna</i> (spiny and easter) <i>Cycas</i>	Animals and plants Reptiles and mammals Pteridophytes and gymnosperms
<i>Ctenophora</i>	Coelenterates and Platyhelminthes
Club moss <i>Chimera</i> (rabbit fish/ratfish) <i>Balanoglossus</i>	Bryophytes and Pteridophytes Cartilaginous and bony fishes Chordates and non-chordates
<i>Archaeopteryx</i> Actinomycetes	Reptiles and birds Bacteria and fungi

4 (b)

Stanley Miller and **Harold Urey** synthesized amino acid by passing an electric discharge in a mixture of ammonia (NH_3), hydrogen (H_2), water vapours (H_2O) and methane (CH_4). The ratio of CH_4 , NH_3 and H_2 in large flask was **2 : 1 : 2**.

5 (c)

Proteinoids are protein like structures consisting of branched chain of amino acids. Proteinoids are formed by the dehydration synthesis of amino acids at a temperature of 180°C

6 (a)

Phylogeny (Gr. *phylon*=tribe or race; *geneia*=origin) is the origin and diversification of any taxon or the evolutionary history of its origin and diversification. It is usually represented as a diagrammatic phylogenetic tree (that traces putative evolutionary relationships), *i.e.* dendrogram.

7 (b)

Common set of characters in group of different ancestry.

Convergent evolution describes the acquisition of the same biological trait in an unrelated lineages.

The wings are the classic example of convergent evolution in action. Flying insects, birds and bats have all evolved the capacity of flight independently. They have 'convergent' on this useful trait.

The ancestors of both bats and birds were terrestrial quadrupeds, and each of them had independently evolved powered flight via adaptations are superficially 'wing-shaped', they are substantially dissimilar in construction.

The bat wing is a membrane stretched across four extremely elongated fingers, while the airfoil of the bird wing is made of feathers, which are strongly attached to the forearm the ulna and the highly fused bones of the wrist and hand the carpometacarpus, with only tiny remnants of two fingers remaining, each anchoring a single feather.

Both bats and birds have retained the thumb for specialized functions. So, while the wings of bats and birds are functionally convergent, they are not anatomically convergent

8 (c)

Genetic drift or Sewall Wright effect is statically significant change in population gene frequencies resulting from by chance and not from natural selection, emigration or immigration. In simple words, random loss of alleles is known as **genetic drift**.

9 (a)

The organs, which perform same function but develop in totally different groups and are totally different in their basic structure and developmental origin are called **analogous organs**.

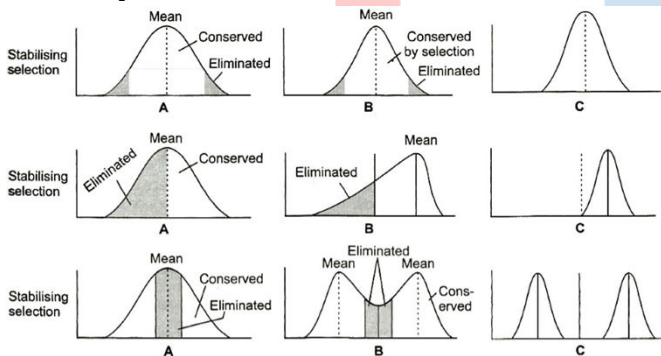
10 (a)

Homo sapiens arose in Africa and moved across continents and developed into deistinct races. During ice-age between 7,000-10,000 years ago, modern *Homo sapiens* arose. Pre-historic cave art developed about 18,000 years ago. Agriculture came around 10,000 years back and human settlements started

11 (c)

Both (a) and (b).

Selection process in natural selection are



(i) **Stabilizing Selection** (Balancing selections) This type of selection favours average sized individuals, while eliminates small sized individuals. It reduces variation and hence, do not promote evolutionary changes. It maintains the mean value from generation to generation. If we draw a graphical curve of population, it is bell-shaped

(ii) **Directional Selection** (Progressive Selection) In this selection, the population changes towards one particular direction. It means this type of selection favours small or large-sized individuals and more individuals of that type will be present in new generation. The mean size of the population changes

(iii) **Disruptive Selection** (Diversifying selection) This type of selection favours both small-

sized and large-sized individuals. It eliminates most of the members with mean expression, so as to produce two peaks in the distribution of the trait that may lead to the development of two different populations. This kind of selection is opposite of stabilizing selection and is rare nature but is very important in bringing about evolutionary changes

12 (d)

Regressive evolution is a phenomenon by which a species loses its features through evolution. It is especially evident in many cave-dwelling species, the majority of which actually descended from species that originally lived above ground.

Some of these organisms happened to have traits that were beneficial in a cave environment, prompting part of the population to move underground. Over time some features, like eyes or skin pigmentation, for example, became unnecessary and eventually disappeared

13 (d)

Natural selection provided better adaptability to the organisms. It wipes out unfit or less adaptive organisms and thus, helpful for better survival.

14 (b)

All except IV, V and II.

Hugo de Vries believed that mutation causes evolution and not the minor heritable variations, which was mentioned by Darwin

Mutation are random and directionless, while Darwin's variations are small and directional

Term 'saltation' is also called single step large mutation, which leads to new specks

15 (a)

$A - p^2 + 2pq + q^2 = 1$; B = Evolutionary charge

16 (d)

Well developed brain, opposable thumb and binocular vision. All of these features are the direction of evolution in human species

17 (c)

The **theory of genetic drift** was proposed by geneticist **Sewall Wright** in 1930. It is also called Sewall Wright effect or scattering of variability. It refers to the 'random fluctuation' in the gene frequencies in a small population generation after generation purely by chance.

18 (b)

The universe is vast relatively speaking the earth. Itself is almost only a speck. The universe is very old almost 20 billion years old. Huge clusters of galaxies comprises the universe

19 (a)

Hardy Weinberg equilibrium describes that under certain conditions of stability allelic frequencies remain constant from generation to generation in sexually reproducing organisms. The Hardy -Weinberg law uses the binomial expression $p^2 + 2pq + q^2 = 1$ to calculate genotype and allele frequencies of a population.

20 (c)

Azoic era

↓

Proterozoic era

↓
Paleozoic era
↓
Mesozoic era
↓
Cenozoic era (recent)

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

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