DPP
DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

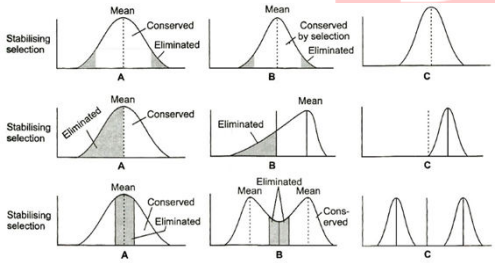
Subject : BIOLOGY
DPP No. : 7

Topic :- Evolution

1 **(c)**
The cranial capacity of Peking man was about **1075 cc**.

2 **(c)**
Although evolutionary changes within most species is thought to occur slowly, recent studies have identified the cases where evolutionary change has apparently occurred over a few generations. Anthropogenically altered environments appears particularly open to the rapid evolutionary changes over comparatively short time scales. Here, we consider a Pacific salmon population that may have experienced life-history evolution, in response to habitat alteration, within a few generations

3 **(d)**
All of these.
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

4 **(c)**
Homologous organis are those organs which have the same basic structure but different

functions. These show common descendent and divergent evolution while analogous organs show convergent evolution.

5 **(a)**

Evolutionary convergence is the development of the common set of characters in a groups 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

6 **(a)**

Contraclile vacuole in *Amoeba* and uriniferous tubule in frog are analogous organs. Analogous organs have different origin and structure but have same function. Similarly, on the basis of same function is called analogy. Both **contractile vacuoles** and **uriniferous tubules** are cocerned with osmoregulation.

7 **(a)**

Neanderthals were the first human beings who believed in the immortality of soul and practised ceremonial burial.

8 **(d)**

Wings of insects and birds are analogous organs because they performs the same function but have different origins

9 **(c)**

Given certain conditions, the allele frequencies remain constant from generation to generation. Under these conditions, a population would be in equilibrium and there will be no evolutionary change. However, many evolutionary changes usually occurs, following the appearance of new alleles and source of this **mutation**.

10 **(d)**

Darwin's theory of inheritance was referred to **pangenesis theory**. **Weismann** (1900) suggested that reproductive cells have the germplasm and they pass traits to the next generation. As the traits of somatoplasm do not transmit to next generation, they are not found in the offsprings. This is the basis of present day **chromosomal theory of inheritance**.

11 **(d)**
Azoic means no life. It was the era which prevailed during the origin of earth. At that time there was no hostile condition for the survival of any living organisms

12 **(a)**
Reproductive isolation states the condition when two populations of a species can no longer interbred. As a result the flow of genetic material stops between them. This leads to the origin of new species

13 **(c)**
DNA variation suggest that there was a greater variation in Asia than in Africa.

14 **(c)**
Allele/gene frequency of 'A' = 0.2
For allelic frequency $A + a = 1$
So, allelic frequency of 'a' = 1 – 0.2 = 0.8

15 **(b)**
Hands of man and wings of bat, forearm of humans and forelimbs of horses are the examples of homology because they have same or common origin but have different functions

16 **(d)**
Cromagnon man is closest ancestor of modern man. The cranial capacity was highest (1680cc). It lived in **France** and **Spain**. It made paintings inside cave and ornaments of ivory. The feeding habit was omnivore. He had aesthetic sense.

17 **(a)**
HW Principle is the genetic structure of allelic frequency of non-evolving population under stable conditions

18 **(d)**
Adaptive radiation is the development of different functional structures from a common ancestral form.

19 **(d)**
Sewall Wright Effect.
Stability of the population and species over the number of generations is met under the following conditions
(i) **No Mutation** Sudden appearance of variations are called mutations. There should not be either gene or chromosomal mutation. Mutation causes changes in gene frequency
(ii) **No Gene flow** (Gene Migration) Within the gene pool of a given breeding population there is a continuous interchange of alleles between organisms. Gene flow refers to the movement of alleles from one population to another as a result of interbreeding between the members of two population. There must not be gene flow between the population
(iii) **No Genetic Drift** Genetic drift is also known as 'Sewall Wright Effect' (named after its discoverer). It is random in gene (allele) frequency. It occurs only by chance. It is non directional. Genetic drift can cause elimination of certain alleles or fixation of the other alleles in the population. Genetic drift refers to a change in the population of alleles in the gene pool. So genetic drift must not occur

(iv) **No Genetic Recombination** The alleles of the parental linkage groups separates and new associations of alleles are formed in the gamate cells, this process is known as genetic recombination. Thus, crossing over during meiosis is a major source of genetic variation within population.

Offspring formed from these gametes showing 'new' combination of the characteristics are called recombinants. There is no genetic recombination

(v) **No Natural Selection Pressure** There must be no natural selection pressure with respect to the alleles in question.

According to Hardy-Weinberg Principle, gene frequencies will remain constant if all above five conditions are met

20 **(b)**

The lycophytes separated from the rest of the early land plants, evolved adequate reproductive, supportive, and transport systems.

Three groups of extinct vascular plants were prevalent in Devonian times; the rhyniophytes, zosterophylls, and trimerophytes. The oldest known vascular plant is *Cooksonia*, a 6.5 centimeter- tall plant with dichotomously branched (forking into two) leafless stems with sporangia at their tips. Only bits and pieces have so far been recovered and no rhizomes or below ground parts have been found. It is a rhyniophyte and its relatives were extinct by mid-Devonian time

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