EVOLUTION

1. - Lamarckism- a character acquired in the life of an organism which is favourable in its adaptation to the environment in inherited.
   - Darwinian Theory – As a result of variations, some organisms become better adapted to the environment. They therefore survive better and mature giving rise to more adapted off springs.
   - The less adapted organisms die before maturity hence been eliminated from the environment.
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2. Adaptive radiation / divergent evolution 1995
3. - Evidence does not support Lamarck' theory.
   - Acquired characteristics are not inherited/inherited characteristics are found in reproductive cells only.
4. Fossils/ (records), palaeontology, Geographical distribution, comparative anatomy/taxonomy; cell biology; comparative serology; comparative embryology; comparative immunology.
5. Assists to eliminate disadvantageous characteristics / perpetuate advantageous characteristics.
   - Allow better-adapted organisms to survive (adverse changes) in environment/less adapted organisms are eliminated by adverse changes in the environment.
6. a) Gives evidences of types of plants, animals organism that existed at certain geological age/ long ago.

b) Gives evidence of relationship among organism / common ancestry of a group of organisms.

7. Nature selects those individuals who are sufficiently well adapted; rejects those that are poorly adapted

8. - For a new species to be formed, a population of organisms must become completely isolated or separated from the others; Over long period of time so that any new variation that rise will not therefore flow to other population.
   - Geographical isolation – this is due to physical barriers e.g. oceans / seas / deserts
   - Ecological Isolation- a barrier resulting form the occupation of different types of habitats from the original type.
   - For reasons of feeding/ predation / breeding as well as <u>environmental changes</u> (e.g. climate and vegetation which may result in population living in different habitats so becoming, ecologically separated from one another)
   - <u>Behavioural isolation</u> alteration in behaviour proceeding mating which include courtship behaviour / lack of attraction between males and females in different chemicals / pheromoes / coloration /songs e.t.c

     <u>Reproduction isolation</u>: a barrier to successful mating between individuals of population; due to structural differences in reproductive organs as well as failure in fertilization/ incompatibility.

     <u>Genetic isolation</u> – Even if fertilization takes place the zygote may be inferior / fails to develop; however if the zygote develops the offspring may be inferior or sterile.

9. a) It is the emergence of present forms of organisms gradually from pre-existing ones some of which no longer exists).

b) It is the drifting apart of the continents from one land mass (Pangaea).

10.

a) When organisms of the same origin become adapted (modified) in different ways in order to fit in the environment. The organisms are separated due to natural factors.

b) When an organism is exposed to drug for sometime it becomes modified (adapted) to living in presence of the drug. The offspring produced therefore survive in presence of the drug. Hence drug resistant.

11. a) Homologous structures – structure / organs that have arisen from a common but they have assumed different functions

b) Analogous structures – Structures/organs that have originated from different ancestors but they perform the same function.

12. a) Natural selection is a process where nature selects those organisms that are well adapted to the prevailing environmental conditions enabling them to survive to reproductive maturity. Those organisms that are poorly adapted die young leaving no offspring and their characteristics are eventually eliminated from the population.

b) Mutation brings about new hereditary characteristics (or hereditary variation) in a species. Some of the new characteristics are favourable but others are unfavorable. Favourable characteristics enable the organism possessing them to compete better in the struggle for existence. The result is that most of them survive to adulthood and give rise to offspring of the next generation. Since characteristics resulting from mutation are inheritable they are passed on to new generation. On the other hand, only very few of those organisms with unfavorable characteristics survive to adulthood and give rise to young ones. The final result is that the favourable characteristics are propagated in

the population giving rise to organisms that are better adapted to the environment. The unfavorable characteristics are gradually weeded out and may eventually get eliminated from the population.

13.(a) A hybrid is an offspring of across between different varieties or breeds of the same species.

(b) Hybrid vigour refers to the improved qualities, such as increased yields, fertility, resistance to diseases and toughness seen in offspring of different.

13. The peppered moth usually on trunks and branches of tress, industrial cities, tree trunks and branches are normally dark in colour due to deposits of soot and other pollutants. A white moth resting on such a trunk or branches is highly conspicuous and is easily picked and eaten by preying birds. A dark moth resting at the same places is effectively camouflaged by the dark background and is not easily seen by preying birds.

- In rural areas, tree trunks and branches are normally white in colour due to growth of lichens. A white moth resting on such a trunk or branch is effectively camouflaged by the white background and is not easily seen by preying birds. A dark moth resting at the same place is highly conspicuous and is easily picked and eaten by praying birds.
- Therefore, dark moths are adapted for survival in industrial areas. Here most of them reach maturity and reproduce more dark moths. On the other hand, only a few white moths survive to maturity and reproduce in industrial areas. In rural areas, most white moth survives to maturity and reproduces more white moths. Here only a few dark moths survive to maturity and reproduce.

14. (a) Special creation is a concept which proposes that all living things were made by God at a specific time and have remained unchanged since.

(b) Organic evolution is a concept which proposes that all living things arose from a few ancient simpler forms through gradual modification.