Evolution

Science, Biology

Questions and Answers Overproduction occurs when species propagate more offspring than the environment can support or they can survive. Adaptation on the other hand is the ability to change in order to conform to environmental conditions.

2. Galapagos finches and fossils of sea shells in the Andes Mountains are two pieces that form the basis of Darwin’s theory of natural selection

3. Difference brought out by reproductive success leads to natural selection which entails survival to reproduction age and then ability to reproduce.

4. Five conditions required for Hardy-Weinberg equilibrium

No selection –lack of differential selection

Random mating –lack of differential reproduction

No migration – lack of gene flow

No mutation -

No genetic drift – infinite size of a population

5. Directional selection occurs when extreme traits are favored over other traits on the extreme. On the other hand, disruptive selection occurs when extreme traits are chosen over intermediate traits whereas stabilizing selection is when intermediate traits are selected over extreme traits.

6. Harmful alleles can be maintained within a population through heterozygote advantage, mutation and gene flow.

7. Conflicts in mating rates may lead to traits that discourage fitness especially in females that have low rates of mating.

8. Genetic drift and mutation can lead to formation of new populations. Genetic drift on the other hand leads to variation in the gene pool while non-random mating and gene flow results in reduction of differences among

populations.

9. Natural selection uses the environment as the basis for choosing traits over others as opposed to artificial selection where obvious traits are favored.

10. Hard body parts are more likely to appear in fossil records because they do not decay easily as opposed to soft tissues that decompose.

11. Two ways of determining the age of fossils are through relative dating and absolute dating.

12. Biogeography is concerned with the geographical location of species all over the planet. Related species or species that share common ancestry can be found in different regions with similar climatic conditions.

13. Analogous structures occur due to convergent evolution for instance wings in both insects and birds while homologous structures are similar in anatomy but different in functions such as bat and birds which have pterodactyl wings. Vestigial structures are redundant with no biological importance or use like the ear bones in humans.

14. Embryonic development is important in explaining evolutionary relationships in that related species usually have patterns of embryonic development that resemble one another. Moreover, similar patterns of development are hypothesized as to have only evolved once.

15. DNA sequences can reveal evolutionary relatedness in that species that have a common ancestor will tend to have sequences that have similar base pairs.

16. Molecular clock is a hypothesis that proposes that the rates of molecular evolution occur across lineages and persist in time for any given gene.

17. Gene flow and genetic drift that occur through migration and mutations which are changes in the genetic material are the forces that lead to speciation or formation of new species.

18. Microevolution refers to changes within a genetic pool which results in small changes in an individual while macroevolution is significant changes in individuals resulting in creation of new species.

19. Species refers to a group of organisms that can freely interbreed giving rise to fertile offspring

20. Barriers to reproduction can either be pre or post zygotic isolation mechanisms. In Pre-zygotic isolation, the mechanism occurred before breeding and include; gametic, mechanical and habitat isolations. On the other hand, post reproduction isolation occurs after copulation in includes mechanisms such as hybrid sterility, zygote mortality and non viable hybrids.

21. Allopatric speciation occurs when species are separated by a physical barrier while parapatric speciation takes place when species are not separated by barriers but live on the same area but develop different adaptations due to things such as pollution. On the other hand, sympatric speciation is controversial because it takes place in members within the same geographical location.

22. Gradualism is a mechanism of evolution for species that evolved over a long period while those that evolved in a short time period used punctuated equilibrium.

23. Migration, competition and mass extinction are the mechanisms through which adaptive radiation occurs.

24. Factors that can cause the extinction of species include; climatic changes, human activities, rising sea levels, invasive species and diseases.

25. Cladistic approaches of has the advantage of being objective and concerned with genealogy and evolution as opposed to other conventional types of classification which place emphasis on species' physical similarities.

26. Life in earth formed spontaneously through reaction of biochemical molecules which was proved by scientists in the 1950's that some biomolecules could react spontaneously leading to life formation.

27. Conditions on earth could have contributed to the development of life on earth since there were plenty of carbon dioxide and nitrogen gas and little levels of oxygen.

28. RNA is considered as the first form of genetic material because it is less developed than the DNA and it mostly occurs in prokaryotic organisms

28. Eukaryotic organelles such as the mitochondrion in eukaryotes evolved from autotrophic a bacterium which was contained within a heterotrophic cell. Endsymbiosis played a role whereby the autotrophic cell produced oxygen which it was unable to use but the heterotrophic mitochondrion used the oxygen.

28. Evidence of human evolution is found within fossil records of Neanderthal man through the Homo erectus to modern man which have become increasingly refined.

29. The evidence that supports the hypothesis of live dispersing from Africa is that there is evidence that the Neanderthal interbred with species from Africa and also there are migratory routes suggesting recent departure from Africa between 65, 000 and 500, 000 years ago.

Works Cited

Hoefnagels Mariëlle. “ Biology: Concepts & Investigations”. New York:

McGraw-Hill Science, 2008