



INDIAN SCHOOL AL WADI AL KABIR

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Worksheet No: 04 WITH ANSWERS	UNIT: GENETICS & EVOLUTION Chapter: EVOLUTION	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

MULTIPLE CHOICE QUESTIONS

1. The conditions of the earth's atmosphere conducive for the origin of life were:

- (a) Presence of high temperature, CH₄, NH₃, and H₂O
- (b) High temperature, CH₄, NH₃, volcanic eruption
- (c) High temperature, volcanic eruption, O₂, NH₃
- (d) Volcanic eruption, CH₃, NH₃ and O₂

Ans. (a)

2. Which of the followings are homologous or analogous (Indicate H for homologous and A for Analogous)

- (a) Wing of bat and butterfly _____ **A**
- (b) Wing of bat and flipper of whale _____ **H**
- (c) Wing of butterfly and flipper of whale _____ **A**
- (d) Flipper of whale and wing of bird _____ **H**

3. Analogous organs arise due to

- (a) Convergent evolution
- (b) Genetic drift
- (c) Divergent evolution
- (d) Artificial selection

Ans. (a)

4. Darwin judged the fitness of species by

- (a) Ability to defend itself
- (b) Number of offsprings produced

(c) Strategy to obtain food

(d) Dominance over other species

Ans. (b)

5. Change in frequency of alleles in a population results in evolution. This statement was proposed by

(a) Darwin

(b) DeVries

(c) Hardy – Weinberg

(d) Morgan

Ans. (c)

TWO MARKS QUESTIONS

6. “Sweet potato tubers and potato tubers are result of convergent evolution.” Justify the statement.

(Hints: Mention the type – analogous organs, no common ancestor, definition of convergent evolution)

7. State the significance of the study of fossils in evolution.

(Hints: Evidence for evolution, paleontological studies, similarities and changes of fossils of different geological time scale)

8. Mention the key concepts about the mechanism of biological evolution/ speciation according to:

(i) Hugo de Vries

(ii) Darwin

(Hints: (i) mutation and saltation, (ii) branching of descent and natural selection)

9. Give some examples showing common embryological patterns among vertebrates.

(Hints: development of vertebrate embryo and presence of vestigial organs)

10. Mention two key concepts of Darwinian’s theory of evolution. What was the concept proposed by Lamarck?

(Hints: branching descent and natural selection, use and disuse theory)

THREE MARKS QUESTIONS

11. How do Darwin’s finches illustrate adaptive radiation?

(Hints: definition of adaptive radiation, Darwin’s finches as example, common ancestry and radiation to different geographical areas based on feeding habit, difference in beak pattern)

12. Explain convergent and divergent evolution with the help of one example each.

(Hints: definition of convergent evolution and example for analogous organs, definition of divergent evolution and example for homologous organs)

13. Name any three organs homologous to human hand. Why are they considered homologous?
(Hints: forelimbs of cheetah, flippers of whale, wings of bats – same structure and different functions)
14. Write Oparin and Haldane's hypothesis about the origin of life on earth. How does meteorite analysis favour this hypothesis?
(Hints: two postulates of Oparin and Haldane's theory of chemical evolution, presence of biomolecules like amino acids in meteorites supports this)
15. Explain any two examples to prove that anthropogenic actions can lead to evolution.
(Hints: explanation of formation of pesticide resistant insects and antibiotic resistant bacteria due to the over usage of pesticides and antibiotics)

FIVE MARKS QUESTIONS

16. (a) State Hardy Weinberg principle. Name any two factors which affect it.
(b) Draw a graph to show that natural selection leads to directional change.
(Hints: State the principle, explanation and mathematical expression, factors – gene flow, migration, genetic drift, mutation, genetic recombination, natural selection – any two, graph of natural selection - directional)
17. (a) Name the primates that lived about 15 million years ago. List their characteristic features.
(b) Where was the first man like animal found?
(c) Write the order in which Neanderthals, *Homo habilis* and *Homo erectus* appeared on earth. State the brain capacity of each one of them
(d) When did modern *Homo sapiens* appear on this planet?
(Hints: (a) –Dryopithecus & Ramapithecus – hairy and walked like gorillas, (b) – Eastern Africa, (c) - *Homo habilis*, *Homo erectus*, Neanderthals – 650 – 800 cc, 900 cc, 1400 cc, (d), during ice age between 75,000 – 10,000 years ago)
18. How does evidence from comparative anatomy and morphology favour the theory of evolution?
(Hints: explanation of homologous organs and divergent evolution & analogous organs and convergent evolution and the examples)

PREVIOUS YEARS' BOARD QUESTIONS

18. Comment on the similarity between the wings of a cockroach and the wings of a bird. What do you infer from the above with reference to evolution?

(Hints: explanation of analogous organs and convergent evolution & no common ancestry)

19. Why are analogous structures a result of convergent evolution?

(Hints: convergent evolution starts from different structures and doing similar functions due to the environment, explanation of analogous organs)

20. List any two propositions of Oparin and Haldane.

(Hints: formation of life from non-living organic molecules, chemical evolution)

21. List any two characteristics of mutation that helps in explaining evolution.

(Hints: change in genetic makeup, heritable, random and directionless)

22. Explain the increase in numbers of melanic moths in the urban areas of post-industrialization period in England.

(Hints: explanation of industrial melanism – conditions during post industrialisation period, formation of melanic moth followed by natural selection)

23. (a) Rearrange the following in an ascending order of evolutionary tree:

Reptiles, salamander, lobefins, frogs

- (b) Name two reproductive characters that probably make reptiles more successful than amphibians.

(Hints: (a) – lobefins, frogs, salamander, reptiles

(b)- internal fertilisation and presence of calcareous shell around eggs)

24. How does the process of natural selection affect Hardy-Weinberg equilibrium? Explain. List other four characters that disturb the equilibrium.

(Hints: explanation of natural selection and operation of directive, stable and disruptive selections, characters – gene migration, recombination, genetic drift, mutation)

25. Darwin observed a variety of beaks in small black birds inhabiting Galapagos Islands. Explain what conclusion did he draw and how.

(Hints: explanation of adaptive radiation, beak pattern of finches, common ancestry)

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