
	INDIAN SCHOOL AL WADI AL KABIR		
Class: XII	Department: SCIENCE 2022 – 23 SUBJECT: BIOLOGY		Date of submission: 24.11.2022
Worksheet No: 12 WITH ANSWERS	UNIT: GENETICS & EVOLUTION Chapter: EVOLUTION		Note: A4 FILE FORMAT
NAME OF THE STUDENT		CLASS & SEC:	ROLL NO.

MULTIPLE CHOICE QUESTIONS

- The conditions of the earth's atmosphere conducive to the origin of life were:
 - Presence of high temperature, CH₄, NH₃, and H₂O
 - High temperature, CH₄, NH₃, volcanic eruption
 - High temperature, volcanic eruption, O₂, NH₃
 - Volcanic eruption, CH₃, NH₃ and O₂
- Which of the followings are homologous or analogous (Indicate H for homologous and A for Analogous)
 - Wing of bat and butterfly _____
 - Wing of bat and flipper of whale _____
 - Wing of butterfly and flipper of whale _____
 - Flipper of whale and wing of bird _____
- Analogous organs arise due to
 - Convergent evolution
 - Genetic drift
 - Divergent evolution
 - Artificial selection
- 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 another species

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

- (a) Darwin
- (b) DeVries
- (c) Hardy – Weinberg
- (d) Morgan

TWO MARKS QUESTIONS

- 6. “Sweet potato tubers and potato tubers are result of convergent evolution.” Justify the statement.
- 7. State the significance of the study of fossils in evolution.
- 8. Mention the key concepts about the mechanism of biological evolution/ speciation according to:
 - (i) Hugo de Vries
 - (ii) Darwin
- 9. Give some examples showing common embryological patterns among vertebrates.
- 10. Mention two key concepts of Darwinian’s theory of evolution. What was the concept proposed by Lamarck?

THREE MARKS QUESTIONS

- 11. How do Darwin’s finches illustrate adaptive radiation?
- 12. Explain convergent and divergent evolution with the help of one example each.
- 13. Name any three organs homologous to human hand. Why are they considered homologous?
- 14. Write Oparin and Haldane’s hypothesis about the origin of life on earth. How does meteorite analysis favour this hypothesis?
- 15. Explain any two examples to prove that anthropogenic actions can lead to evolution.

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.

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?

PREVIOUS 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?
19. Why are analogous structures a result of convergent evolution?
20. List any two propositions of Oparin and Haldane.
21. List any two characteristics of mutation that helps in explaining evolution.
22. Explain the increase in numbers of melanic moths in the urban areas of post-industrialization period in England.
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.
24. How does the process of natural selection affect Hardy-Weinberg equilibrium? Explain.
 List other four characters that disturb the equilibrium.
25. Darwin observed a variety of beaks in small black birds inhabiting Galapagos Islands.
 Explain what conclusion did he draw and how.

Qn. No.	MULTIPLE CHOICE QUESTIONS	Marks
1	(a) Presence of high temperature, CH ₄ , NH ₃ , and H ₂ O	1
2	(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	1
3	(a) Convergent evolution	1
4	(b) Number of offsprings produced	1
5	(c) Hardy – Weinberg	1
	TWO MARKS QUESTIONS	
6	(Hints: Mention the type – analogous organs, no common ancestor, definition of convergent evolution)	2

7	(Hints: Evidence for evolution, paleontological studies, similarities and changes of fossils of different geological time scale)	2
8	(Hints: (i) mutation and saltation, (ii) branching of descent and natural selection)	2
9	(Hints: development of vertebrate embryo and presence of vestigial organs)	2
10	(Hints: branching descent and natural selection, use and disuse theory)	2
THREE MARKS QUESTIONS		
11	(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)	3
12	(Hints: definition of convergent evolution and example for analogous organs, definition of divergent evolution and example for homologous organs)	3
13	(Hints: forelimbs of cheetah, flippers of whale, wings of bats – same structure and different functions)	3
14	(Hints: two postulates of Oparin and Haldane's theory of chemical evolution, presence of biomolecules like amino acids in meteorites supports this)	3
15	(Hints: explanation of formation of pesticide resistant insects and antibiotic resistant bacteria due to the over usage of pesticides and antibiotics)	3
FIVE MARKS QUESTIONS		
16	(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)	5
17	(Hints: (a) –Dryopithecus & Ramapithecus – hairy and walked like gorillas, (b) – Eastern Africa, (c) - <i>Homo habilis</i> , <i>Homo erectus</i> , Neanderthals – 650 – 800 cc, 900 cc, 1400 cc, (d), during ice age between 75,000 – 10,000 years ago)	5
PREVIOUS BOARD QUESTIONS		
18	(Hints: explanation of analogous organs and convergent evolution & no common ancestry)	2
19	(Hints: convergent evolution starts from different structures and doing similar functions due to the environment, explanation of analogous organs)	2

20	(Hints: formation of life from non-living organic molecules, chemical evolution)	2
21	(Hints: change in genetic makeup, heritable, random and directionless)	2
22	(Hints: explanation of industrial melanism – conditions during post industrialisation period, formation of melanic moth followed by natural selection)	3
23	(Hints: (a) – lobefins, frogs, salamander, reptiles (b)- internal fertilisation and presence of calcareous shell around eggs)	2
24	(Hints: explanation of natural selection and operation of directive, stable and disruptive selections, characters – gene migration, recombination, genetic drift, mutation)	3
25	(Hints: explanation of adaptive radiation, beak pattern of finches, common ancestry)	3

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