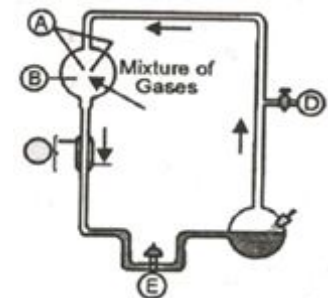


Class 12 Biology Evolution Chapter 7 Important Questions **Answers at the Bottom**

Ch-7 Evolution

- The theory of use and disuse was given by
 - Aristotle
 - Lamarck
 - Stebbins
 - Vavilov
- What's the difference between natural selection and sexual selection?
 - Sexual selection is a type of natural selection
 - Sexual selection occurs during sex
 - Sexual selection occurs within demes, natural selection does not
 - Natural selection is a type of sexual selection
- How is extinction represented in a tree diagram?
 - A branch shifts along the Y axis
 - A branch shifts along the X axis
 - A branch splits
 - A branch ends
- What was the mixture of gases used in chamber marked A?
 - Oxygen O_2 , ammonia (NH_3), hydrogen H_2 , and water H_2O
 - Methane(CH_4) v, ammonia(NH_3), hydrogen H_2 and water H_2O
 - Oxygen O_2 , ozone O_3 , hydrogen H_2 , and water H_2O
 - Oxygen O_2 , ozone O_3 , hydrogen H_2 , and water H_2O
- Match the correct brain capacities given in Column B with the primates given in Column A



Column A	Column B
(a) Homo erectus	(i) 650 – 800 cc
(b) Neanderthal man	(ii) 900 cc
(c) Homo habilis	(iii) 1400 cc
(d) Australopithecus	(iv) 600 cc

- (a) – ii, (b) – iii, (c) – i, (d) – iv
- (a) – iii, (b) – ii, (c) – ii, (d) – iv
- Can't say
- (a) – i, (b) – ii, (c) – iv, (d) – iii

6. The variation and natural selection operates on its own due to random mutations.
What does this imply about natural selection?
7. What is the significance of Lederberg experiment?
8. Name the placental mammals corresponding to the Australian 'spotted cuscus' and Tasmanian 'tiger cat' which have evolved as a result of convergent evolution.
9. Name the common ancestor of great apes and man?
10. What is Archaeopteryx? What is its significance in evolution?
11. Would you consider the wings of butterfly and a bat as a homologous or analogous?
12. Classify the following as examples of homology and analogy:

(i)	Mouth parts of cockroach and butterfly
(ii)	Hearts of rabbits and human beings
(iii)	Eyes of octopus and mammals
(iv)	Sweet potato and potato
(v)	Stings of honey bee and scorpion
(vi)	Tendrils of Lathyrus and tendrils of Gloriosa

13. What are vestigial organs? Give examples.
14. In the 1950s, there were hardly any mosquitoes in Delhi. The use of pesticide DDT on standing water killed their larvae. It is believed that now there are mosquitoes because they evolved DDT resistance through the interaction of mutation and Natural selection. Point wise, state in a sequence how that could have happened.
15. How does industrial melanism support Darwin's theory of natural selection explain?

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Answer

1.

- b. Lamarck, **Explanation:** The theory of use and disuse was given by Lamarck. In his theory of organic evolution he stressed that those traits or organs are used more evolve faster and those are not used degenerate in course of time.

2.

- a. Sexual selection is a type of natural selection, **Explanation:** Natural selection is the survival of members of species having some new traits that may help the organism in given surrounding. Sexual selection is a kind of natural selection as mating between similar organisms only leads to reproduction.

3.

- d. A branch ends, **Explanation:** In a tree diagram, the extinction is represented as a branch ends that further do not divide any more. Extinction may be due to changed climatic condition or loss of ecological niche.

4.

b. Methane(CH_4) v, ammonia(NH_3), hydrogen H_2 and water H_2O

Explanation: the gases used in Urey and Miller experiment in chamber marked A are Methane (CH_4), ammonia (NH_3), hydrogen H_2 , and water H_2O

5.

a. (a) – ii, (b) – iii, (c) – i, (d) – iv

Explanation:

- The average brain size of Homo erectus is estimated to have been roughly 900 cubic centimeters.
- Neanderthals are known for their large cranial capacity, which at $1,400 \text{ cm}^3$ is larger on average than that of modern humans. One study has found that Neanderthal brains were more asymmetric than other hominid brains.
- Homo habilis' brain capacity of around $650 - 800 \text{ cm}^3$ was on average 50% larger than australopithecines, but considerably smaller than the 1350 to 1450 cm^3 range of modern Homo sapiens.
- Australopithecus africanus. A. africanus existed between 3 and 2 million years ago. It is similar to afarensis, and was also bipedal, but body size was slightly greater. Brain size may also have been slightly larger around 600 cc.

6. Natural selection is nevertheless a directed process- the likelihood one variant will be favored in a given environment over another is predictable, even if the origin is not. The variation and natural selection operates on its own due to random mutation. Natural selection is nevertheless directed process in which one variant will be favored in a given environment over the other.

7. It demonstrates that pre-existing gene mutation is the basis of adaption.

8. Lemur and Bobcat

9. Dryopithecus.

10. Archaeopteryx was the first flying reptile (dinosaur). It is considered as a connecting link between reptile and bird.

11. It is an example of analogous organ as the basic structure of the wings of butterfly is different from that of the wings of the bat. Their function is similar and is used for flying.

12.	(i)	Mouth parts of cockroach and butterfly	homology
	(ii)	Hearts of rabbits and human beings	analogy
	(iii)	Eyes of octopus and mammals	analogy
	(iv)	Sweet potato and potato	analogy
	(v)	Stings of honey bee and scorpion	analogy
	(vi)	Tendrils of Lathyrus and tendrils of Gloriosa	analogy

13.

- **Vestigial organs** – These are the organs in an organism which are fully developed but non- functional in present time. They had proper functions and use in the ancestors.
- There are about 80 vestigial organs in the human body which mainly include coccyx (tail bone), nictitating membrane (3rd eyelid), caecum and vermiform appendix, canines, wisdom teeth, body hair, auricular muscles, mammary glands in male, etc.
- Vestigial organs are also present in some other animals e.g., splint bones in the horse, hind limbs and pelvic girdles in python, wings, and feathers in flightless birds, etc.
- Scale leaves of parasitic flowering plants and staminodes are few of the vestigial organs in plants.

14. – When DDT was first used, most of the mosquitoes were sensitive to it and were therefore killed.

- In the original population of mosquitoes, some individuals were resistant to DDT.
- They did not have any advantage over the DDT sensitive mosquitoes, in the absence of DDT.
- They survived in the presence of DDT and reproduced the offspring were also mostly DDT resistant.
- As a result, over a period of time almost the entire population came to consist of the resistant type.

15. Industrial Melanism is an adaptation, where the moths living in the industrial area developed melanin pigments to match their body to the tree trunk that were covered with black soot. Before industrialization, in Great Britain, it was observed that there were more white winged moths. However, after industrialization the white coloured lichen covered the tree trunks. In that background the white winged moths survived but the dark coloured moths were eaten by predators. During the post industrialization periods the tree trunks became dark due to industrial smoke and soots. Under such conditions, the white winged moths did not survive due to predators and dark winged moths survived. In areas where industrialization did not occur, the count of moths were low. Thus, industrial melanism supports evolution by natural selection.