



SHIKSHA CLASSES

Subject : Science-II
Class : X

ANSWERS PAPER
1. Heredity and Evolution

Total Marks : 20

Q. 1 A) Choose the correct alternative.

2

1) **The process by which nucleotide in the gene suddenly changes its position called-----.**

Ans : c) Mutation

2) ----- is not the vestigial organ in the human body.

Ans : c) Canine

Q. 1 B) Solve the following question. (Any One)

1

1) **Identify the correlation between the first two words and suggest the suitable word in fourth**

Survival of fittest : Darwin : : Acquired Character : -----.

Ans : Survival of fittest : Darwin : : Acquired Character : **Jean - Baptiste Lamarck** .

2) **What is evolution?**

Ans : Evolution is the gradual change occurring in living organisms over a long duration.

3) **Which animal is called a connecting link between reptiles and mammals?**

Ans : Peripatus is called a connecting link between reptiles and mammals.

Q. 2 A) Give scientific reason. (Any One)

2

1) **Peripatus is said to be connecting link between Annelida and Arthropoda.**

Ans : In peripatus characters like segmented body thin cuticle, and parapodia like organs are present. These characters are shown in annelida.

Similarly Peripatus show tracheal respiration and open circulatory system similar to arthropodas.

Therefore peripatus is said to be connecting link between annelida and arthropoda.

2) **Natural selection plays important role in survival.**

Ans : Natural selection plays important role because nature selects only those organisms which are fit to live and the rest perish. Sustaining and selected organisms can perform reproduction and thereby give rise to the new species with their own specific characters.

Q. 2 B) Solve the following question. (Any Two)

4

1) **What is embryological and anatomical evidences.**

Ans : 1) Embryological evidences :

- 1) Comparative study of embryonic developmental stages of various vertebrates show that all embryos show extreme similarities during initial stages and those similarities decrease gradually.
- 2) Similarities in initial stages indicate the common origin of all the animals.

Anatomical Evidences :

- 1) There is similarity in structure of bones and bony joints in organs of each animals.
- 2) This similarity indicates that animals may have common ancestor.

2) Explain the theory of evolution.

Ans : Theory of Evolution.

- 1) According to theory of evolution (protoplasm) has been formed in ocean.
- 2) In due course of time, unicellular organism was formed.
- 3) Gradually, change occurred in the unicellular organism from which larger and more complex organisms were formed.
- 4) All those changes were slow and gradual.
- 5) Duration of all these changes is at the most 300 Crore years.
- 6) Changes and development in living organisms had been all round and multi-dimensional and this led to evolution of different types of organisms.
- 7) Hence, this overall process is called as evolution which is organizational.
- 8) Progressive development of plants and animals from the ancestors having different structural and functional organization is called evolution.

3) What is the use of science of heredity?

Ans : The science of heredity is useful for diagnosis, treatment and prevention of hereditary disorders, production of hybrid varieties of animals and plants and in industrial processes in which microbes are used.

4) Explain with suitable examples importance of anatomical evidences in evolution.

- Ans :**
- i) Anatomical evidences can be obtained by comparative anatomy studies which is the study of similarities and differences in the anatomy of different species.
 - ii) Anatomical evidences can be used to trace back common ancestry.
 - iii) Example - Human hands, cats foreleg, patagium of bat, flipper of whole look different on a superficial level and also have different functions. But there are similarities in the bones and bony joints in the organs to those animals.

Q.3 Solve the following question. (Any Two)

6

1) What is carbon dating?

Ans : Carbon dating :

- 1) Carbon dating method is based upon the radioactive decay of naturally occurring C-14 and it is development by Willard Libby.
- 2) Carbon consumption of animals and plants stop after death and since then, only the decaying process of C-14 occurs continuously.

- 3) In case of dead bodies of plants and animals, instead of remaining constant, the ratio between C-14, and C-12 is non – radioactive.
- 4) The time passed since the death of a plant or animal can be calculated by measuring the radioactivity of C-14, and ratio of C -14 to C-12 present in their body.
- 5) This is carbon dating method.

2) Explain Darwin’s theory of natural selection.

Ans : Darwin’s theory of natural selection

- 1) Charles Darwin had collected innumerable specimens of plants and animals and depending upon the observations of those specimens, he published the theory of natural selection which preaches the survival of fittest.
- 2) For this purpose, Darwin had published a book titled ‘Origin of species’.
- 3) While explaining the concept, Darwin says that all the organisms reproduce prolifically.
- 4) All the organisms compete with each other in a life threatening manner.
- 5) In this competition, only those organisms sustain which shows the modification essential for winning the competitions.
- 6) However, besides this, natural selection also plays important role because nature selects only those organisms which are fit to live and the rest perish.
- 7) Sustaining and selected organisms can perform reproduction and thereby give rise to the new species with their own specific characters.
- 8) Darwin’s theory of natural selection was widely accepted for long duration.

3) Write four difference between Transcription and Translation.

Transcription	Translation
1) It is the process of synthesis of RNA from DNA.	1) It is the process of synthesis of protein from RNA
2) This process occurs in the nucleus.	2) This process occurs in the cytoplasm.
3) A chain of nucleotides is produced.	3) A chain of amino acid specified by the mRNA sequence is produce.
4) Nucleotides are bonded by phosphodisetter	4) Amino acid are bonded by peptide bond.

4) Define fossil. Explain importance of fossils as proof of evolution.

Ans : Fossils :

Large number of organisms get buried due to disasters like flood, earthquake volcano etc. Remnants and impressions of such organisms remain preserved underground. These are called as fossils.

Importance of fossils as proof of evolution :

Carbon consumption of animals and plants stops after death and since then only the decaying process of C-14 occurs continuously.

The carbon dating method is used in paleontology and anthropology for determining the age of human fossils and manuscripts. Once the age of fossil been determined by such technique, it becomes easy to deduce the information about other organism. It seems that vertebrates have been slowly originated from invertebrates.

Q. 4 : Solve the following question. (Any One).

5

1) Explain Lamarckism.

Ans : Lamarckism :

- 1) Jean Baptist Lamarck proposed that morphological changes occurring in living organisms are responsible for evolution and the reason behind those morphological changes is activities or laziness of that organism.
- 2) He called this concept as principle of use or disuse of organs.
- 3) The neck of giraffe has become too long due to browsing on leaves of tall plants by extending their neck for several generations.
- 4) Shoulders of the ironsmith have become very strong due to frequent hammering movements.
- 5) Wings of birds like Ostrich and Emu have become weak due to no use.
- 6) Legs of the birds like swan and duck have become useful for swimming due to living in water.
- 7) Snakes have lost their leg by modifications in their body for burrowing habit.
- 8) These acquired characters are transferred from one to another generation.
- 9) This is called as theory of inheritance of acquired characters or Lamarckism.
- 10) Development of organs due to specific activities or their degeneration due to no use at all was widely accepted but transfer of those characters from generation to generation was rejected.
- 11) Because it had been verified many times that modification brought in use are not transferred to next generation and thereby Lamarck's theory was disproved.

2) Define vestigial organs. Write names of some vestigial organs in human body and write the names of those animals in whom same organs are functional.

Ans : Vestigial organ :

Degenerated or under developed organs of organisms are called as vestigial organs.

Appendix which is useless to human is useful and fully functional organ in ruminants. Similarly muscles of ear pinna which are useless to human are useful in monkeys for movement of earpinna.

Various vestigial organs like tail bone (coccyx), wisdom teeth and body hairs are present in body of human being.

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