SELF ASSESSMENT TEST – ANSWERS

(Chapter 5 : Origin and evolution of life)

SECTION – A

Q. 1. Multiple Choice Questions (MCQ) : *(1 mark each)*

(i) (c) *Australopithecus*

(ii) (b) directional

(iii) (a) Sedimentary rocks

(iv) (c) Continuity of life can be explained by this theory

Q. 2. Very Short Answer Questions (VSA) : *(1 mark each)*

(i) Thorns of *Bougainvillea* and tendrils of *Cucurbita*.

(ii) Coacervates are colloidal aggregations of hydrophobic proteins and lipids which grew in size by taking up material from surrounding aqueous medium.

SECTION – B

Q. 3. Short Answer Questions (SA - I) : *(2 marks each)*

(i) (1) Fossils are studied under palaeontology. They are used in reconstruction of phylogeny.

(2) Fossil study helps in studying various forms and structures of extinct animals.

(3) By understanding the structure of fossil, record of missing link between two groups of organisms can be deduced.

(4) By studying fossils various body forms and their evolution can be understood, they also help to understand the habit and habitat.

(5) Some fossils provide the evolutionary evidences such as connecting links.

(ii) (1) Cambrian – (d) Trilobite

(2) Ordovician – (c) Jawless fishes

(3) Silurian – (b) First terrestrial animals

(4) Devonian – (a) Amphibians

SECTION – C

Q. 4. Short Answer Questions (SA - II) : *(3 marks each)*

(i) (1) **Height of neck of Giraffe :** Long-necked giraffe came into existence in the following way. Long-necked giraffe could pluck and eat more leaves from tall trees and woody climbers. So it was well adapted to the environment. Short-necked one could not get food and thus perished in the struggle. This adaptation was transmitted to their offspring.

(2) **Black colour peppered moths :** The example of industrial melanism seen in U.K. is an excellent example of natural selection in action. Black coloured moths evolved gradually as new species from the previous white coloured forms.

(3) **DDT resistance in mosquitoes:** Intensive DDT spraying destroyed all types of mosquitoes. Some mosquitoes developed resistance to DDT and survived in spite of DDT spray. They reproduced more and were thus selected naturally.

(ii) (1) Neanderthal man (*Homo neanderthalensis)* is described as advanced prehistoric man.

(2) Its first fossil was collected from Neanderthal valley in Germany by Fuhlrott (1856). Neanderthal man existed in late Pleistocene epoch about 1,00,000 to 40,000 years ago. It was widely spread in Europe, Asia and north America. It became extinct about 25,000 years ago.

(3) It was heavily built and short and had outwardly curved thigh bones.

(4) The facial features were as follows : Prominent brow ridges, thick skull bones, low and slanting forehead, deep jaw without a chin, etc.

(5) The cranial capacity of Neanderthal man was about 1400 cc, which was roughly equal to that of modern man. He used hide for dressing.

(6) It showed intellectual development in constructing and using flint tools and fire. They used to bury their dead bodies along with their tools and perform ceremonies.

SECTION – D

Q. 5. Long Answer Questions (LA) : ***(4 marks)***

Genetic variations : The change in gene and gene frequencies is known as genetic variation, which are caused by following factors :

(1) **Mutations :** Sudden permanent heritable change is called mutation. Mutation can occur in the gene, in the chromosome structure and in chromosome number. Mutation that occurs within the single gene is called point mutation or gene mutation. This leads to the change in the phenotype of the organism, causing variations.

(2) **Genetic recombination :** In sexually reproducing organisms, during gamete formation, exchange of genetic material occurs between non-sister chromatids of homologous chromosomes. This is called crossing over. It produces new genetic combinations which result in variation. Fertilization between opposite mating gametes leads to various recombinations resulting into the phenotypic variations. These result in change in the frequencies of alleles.

(3) **Gene flow:** Gene flow is movement of genes into or out of a population. Gene movement may be in the form of migration of organism, or gametes (dispersal of pollens) or segments of DNA (transformation). Gene flow also alters gene frequency causing evolutionary changes.

(4) **Genetic drift:** Any random fluctuation (alteration) in allele frequency, occurring in the natural population by pure chance, is called genetic drift. For example, when the size of a population is severely reduced due to natural disasters like earthquakes,

floods, fires, etc. elimination of particular alleles from a population becomes possible. Smaller populations have greater chances for genetic drift. It results in the change in the gene frequency. Genetic drift is also an important factor for evolutionary change.

(5) **Chromosomal aberrations :** The structural, morphological change in chromosome due to rearrangement of genes is called chromosomal aberrations, due to changes in the gene arrangement or gene sequence variations are caused.