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BIOLOGY

N-314

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BASED ON

N.I.O.S. *Class* – XII

National Institute of Open Schooling

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Based on: **NATIONAL INSTITUTE OF OPEN SCHOOLING – XII**

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Sample Preview of the Solved Sample Question Papers

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Solved Sample Paper - 1

Based on NIOS (National Institute of Open Schooling)

Biology - XII

N-314

Time : 3 Hours **Maximum Marks : 100**

Note : *(i)* This question paper consists of 43 questions. *(ii)* All questions are compulsory. Write your answers in the Answer-Book. *(iii)* Marks are given against each question. Section-A consists of Questions Nos. 1 to 16 Multiple-Choice Type Questions (MCQs) carrying 1 mark each. Select and write the most appropriate option out of the four options given in each of these questions. An internal choice has been provided in some of these questions. You have to attempt only one of the given choices in such questions. Section-B consists of Question Nos. 17 to 28 Objective-type questions carrying 2 marks (with 2 sub-parts of 1 mark each). Attempt these questions as per the instructions given for each of the questions. Section-C consists of Question Nos. 29 to 37 Very Short Answer-type Questions carrying 2 marks each to be answered in the range of 30 to 50 words. Section-D consists of Question Nos. 38 to 41 Short Answer-type Questions carying 3 marks each to be answered in the range of 50 to 80 words. Section-E consists of Question Nos. 42 and 43 Long Answer-type Questions carrying 5 marks each to be answered in the range of 80 to 120 words.

SECTION-A

Q. 1. In the bacterial cell, the genetic material is located in:

(a) Plasma membrane *(b)* Nucleus
(c) Cytoplasm *(d)* Nucleoid

Ans. *(d)* Nucleoid.

Q. 2. The blood vessel which carries oxygenated blood from the lungs to the heart is:

(a) Pulmonary artery *(b)* Aorta
(c) Pulmonary vein *(d)* Vena cava

Ans. *(c)* Pulmonary vein.

Or

The blood vessel which collects and brings deoxygenated blood from the lower parts to the heart is:

(a) Inferior vena cava *(b)* Pulmonary vein
(c) Superior vena cava *(d)* Aorta

Ans. *(a)* Inferior vena cava.

Q. 3. Which of the following organs is *not* a part of the female reproductive system in cockroach?

(a) Uterus *(b)* Oviduct
(c) Vegina *(d)* Ovary

Ans. *(a)* Uterus.

Q. 4. A person is unable to see in dim light. He/She is suffering from deficiency of:

(a) Protein *(b)* Vitamin A
(c) Vitamin E *(d)* Vitamin B-complex

Ans. *(b)* Vitamin A.

Or

Which of the following statements defines the term 'parasitism'?

(a) Both the species are adversely affected
(b) Both the species are benefited
(c) One species is benefited and the other is not affected
(d) One species is benefited and the other is affected

Ans. *(d)* One species is benefited and the other is affected.

Q. 5. A male infant was born with an extra X-chromosome. This genetic disorder is called as:

(a) Mongolism
(b) Bleeder's disease
(c) Turner's syndrome
(d) Klinefelter's syndrome

Ans. *(d)* Klinefelter's syndrome.

Q. 6. Vascular bundles are scattered in which of the following?

(a) Monocot stem *(b)* Dicot root
(c) Monocot root *(d)* Dicot stem

Ans. *(a)* Monocot stem.

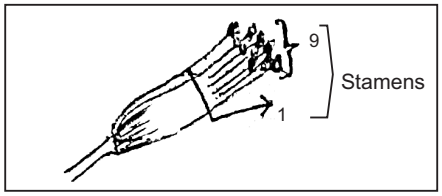
Or

Exarch xylem is present in which plant part?

(a) Flower *(b)* Leaf
(c) Stem *(d)* Root

Ans. *(d)* Root.

Q. 7. Arrangement of stamens is shown in the diagram given below. Which of the following plants exhibits such type of arrangement of stamens?



Solved Sample Paper - 2

Based on NIOS (National Institute of Open Schooling)

Biology – XII

N-314

Time : 3 Hours **Maximum Marks : 100**

Note : *(i)* This question paper consists of 43 questions. *(ii)* All questions are compulsory. Write your answers in the Answer-Book. *(iii)* Marks are given against each question. Section-A consists of Questions Nos. 1 to 16 Multiple-Choice Type Questions (MCQs) carrying 1 mark each. Select and write the most appropriate option out of the four options given in each of these questions. An internal choice has been provided in some of these questions. You have to attempt only one of the given choices in such questions. Section-B consists of Question Nos. 17 to 28 Objective-type questions carrying 2 marks (with 2 sub-parts of 1 mark each). Attempt these questions as per the instructions given for each of the questions. Section-C consists of Question Nos. 29 to 37 Very Short Answer-type Questions carrying 2 marks each to be answered in the range of 30 to 50 words. Section-D consists of Question Nos. 38 to 41 Short Answer-type Questions carying 3 marks each to be answered in the range of 50 to 80 words. Section-E consists of Question Nos. 42 and 43 Long Answer-type Questions carrying 5 marks each to be answered in the range of 80 to 120 words.

SECTION-A

Q.1. These are called "suicidal bags".

(a) Golgi body
(b) Mitochondria
(c) Endoplasmic Reticulum (ER)
(d) Lysosomes

Ans. *(d)* Lysosomes.

Q. 2. Which of the following is dead tissue?

(a) Sclerenchyma *(b)* Aerenchyma
(c) Parenchyma *(d)* Collenchyma

Ans. *(a)* Sclerenchyma.

OR

According to which theory, the apical meristem of stem and root are composed of small mass of cells which are all alike and divide fast:

(a) Physical Force Theory
(b) Histogen Theory
(c) Tunica Corpus Theory
(d) Cell Theory

Ans. *(b)* Histogen Theory.

Q.3. This technique of growing plants in a nutrient solution in complete absence of soil is known as:

(a) Aeroponics *(b)* Hydroponics
(c) Lithoponics *(d)* none of the above

Ans. *(b)* Hydroponics.

Q. 4. The absorption and adsorption of water in plants by protoplasmic and cell wall constituents refer to:

(a) Imbibition *(b)* Osmosis
(c) Diffusion *(d)* Plasmolysis

Ans. *(a)* Imbibition.

OR

De-plasmolysis occur when:

(a) When a cell is placed in a hypertonic solution
(b) When a cell placed in a hypotonic or dilute solution
(c) When a cell is placed in an isotonic solution
(d) all the above

Ans. *(b)* When a cell placed in a hypotonic or dilute solution.

Q. 5. Which family of angiosperms includes cereals?

(a) Liliaceae *(b)* Malvaceae
(c) Poaceae *(d)* Fabaceae

Ans. *(c)* Poaceae.

Q. 6. A sudden genetic change affecting single or many genes refer to:

(a) Mutation
(b) Genetic recombination
(c) Gene flow
(d) Genetic drift

Ans. *(a)* Mutation.

OR

The organs which are similar in structure and origin but may look very different and perform different functions are:

(a) Vestigial Organs
(b) Analogous Organs
(c) Homologous Organs
(d) None of the above

Ans. *(c)* Homologous Organs.

Sample Preview of The Chapter

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BIOLOGY

DIVERSITY AND EVOLUTION OF LIFE

Origin and Evolution of Life and Introduction to Classification

1

INTRODUCTION

The earth came into existence about 5 billion years ago. Earlier life was not possible due to presence of hot gases and vapours of various chemicals, gradually these cooled down and various chemical reactions occurred and hydrogen (H_2), methane (CH_4), ammonia (NH_3), water vapour (H_2O) present in atmosphere reacted to form amino acids, nitrogenous base, sugar and fatty acids which further combined to form proteins and nucleic acid and hence, lead to the origin of life on the earth surface. The primitive organisms were simpler in form, which over a course of time changed to complex form called **Evolution**. These organisms on the earth were result of descent, with modification from a common ancestortheory called *Organic Evolution.* **Charles Darwin** an English scientist explained the mechanism of Evolution through the theory of natural selection, but later on with advances in genetic the sources of variations were discovered so this theory was modified and termed as Neo-Darwinism or modern synthetic theory, which took into consideration the variation, mutation and differential reproduction. Variation in an individual arise due to Mutation, Genetic combination gene flow and genetic drift e.g. DDT resistant mosquitoes. The variations sometimes leads to speciation, which is of two types–Allopatric Speciation and Sympatric Speciation. The earliest individual to evolve on earth are bacteria, having single chromosome and no nuclear membrane hence called prokaryotes. Organisms other than bacteria possessing well defined nucleus are called eukaryotes. R.H. Whittakar in 1969 gave the five kingdom classification of the organisms which includes Monera, Protista, Fungi, Plantae and Animalae. There was one more category called virus which poses a classification problem as they can replicate, but cannot reproduce on their own and reproduce only when inside the cell, so can be regarded as live but can be crystallised and are non-cellular so considered to be non-living. It infects bacteria, plants and animals and is highly mutating i.e. it keeps on

changing it's genetic material. When virus attack bacteria it's called bacteriophage. These viruses are responsible for many diseases like Cancer, Herpes, Small pox and even AIDS etc.

INTEXT QUESTIONS–1

Q. 1. Approximately how many years ago was the earth form?

Ans. The earth was formed about 5 billion years ago.

Q. 2. Who gave chemosynthetic theory for the origin of life?

Ans. The chemosynthetic theory of life was given by A.I. Oparin. It is by far the most widely accepted theory.

Q. 3. Name the four gases present in primitive atmosphere of earth.

Ans. Initially, on the earth NH_3, CH_4, H_2 and H_2O were present.

Q. 4. Name the source of energy which was used for chemical combination in atmosphere.

Ans. Life on the earth originated through a series of combinations of chemical substances and these all things happened in the water. As we all know, to carry out any reaction there need some energy and for this chemical combination to take place lightening or ultra violet rays or geo thermal energy acted as a source of energy.

Q. 5. Where did life originate in water or on land?

Ans. Origin of life means the appearance of simplest primordial life from non- living matter. For this origin of life certain series of combinations of chemical substances took place and this all happened in water.

Q. 6. What are coacervates?

Ans. Coacervates are little ball of organic matter which is formed by the repulsion of water by something like oil. During the origin of life Charles Darwin proposed that all living things may come from a single common ancestor, an ''unorganism'', presumably something very simple. Later on **Oparin** suggested that the first ''unorganism'' could have formed from non-living organic matter called coacervate.

Q. 7. In the origin of life large molecules were formed from inorganic compounds. Name any two such large molecules.

Ans. During the origin of life the inorganic compound present in the atmosphere viz. Ammonia (NH_3) Hydrogen (H_2) Methane (CH_4) Water vapour (H_2O) went through a series of combinations and give rise to larger molecule viz. Amino acids, Nitrogenous base, sugar and fatty acids etc.

Q. 8. Name the two scientists who experimentally tried to verify Oparin's hypothesis?

Ans. There were several theories proposed to explain the origin of life, of them the most accepted one is *Chemosynthetic Theory of Origin of Life*, which was proposed by A.I. Oparin. Later on Miller and Urey, the two scientists tried to verify the hypothesis proposed by Oparin.

INTEXT QUESTIONS–2

Q. 1. Define organic evolution.

Ans. The formation of complex organisms through change from simpler ancestral type with the course of time is called *evolution*.

This process of evolution is very slow and gradual. These adaptations for survival are handed over from generation to generation. Thus, the theory of organic evolution states that all living things on the earth are here as a result of descent, with modification from a common ancestor.

Q. 2. Name one fossil animal which forms a connecting link between reptiles and aves.

Ans. Fossil animals are those animals which were once present, but with the course of evolution have become extinct. e.g. Archaeopteryx.

Q. 3. Which organ of man is homologous to the wings of birds?

Ans. The forelimb or we can say the arms of man are homologous to the wings of birds. This is an example of adaptation, where the individual adapt itself according to the environment.

Q. 4. Define vestigial organs.

Ans. Vestigial organs are those organs which were functional earlier, but with the course of evolution have become non-functional, but are still present. e.g. Appendix in human beings.

Q. 5. Give one example of a connecting link among the living beings.

Ans. Connecting links are those individuals which have some primitive characters and some complex characters, indicating the gradual evolution that took place during the course of generations.

For example egg laying mammals: In this example as we see the mammal is laying egg, but presently mammals don't lay egg, but give birth to the young ones. So this connecting link explain that earlier mammals were egg laying mammals.

Q. 6. Give two examples from molecular biology which support organic evolution.

Ans. Different examples were given to support the organic evolution, the molecular evidences are one of them. Molecular evidences of evolution can be explained as follows:

1. DNA (the hereditary material), ribosomes, the cellular organelles are of universal occurrence in organisms.
2. Cell the basic unit of life, which is made of biomolecules is also common to all organisms.
3. The sequence of nucleotides, transcription, translation are common to all organisms.

INTEXT QUESTIONS–3

Q. 1. Who gave the theory of natural selection?

Ans. Darwin gave the theory of natural selection, who is regarded as the father of evolution. According to him, all kind of organisms are related through ancestory and the mechanism for their evolution is *Natural Selection.* He proposed that in the process of natural selection, organisms produce more offsprings due to limited resources and during struggle for existence only those individuals having advantageous variations survive and reproduce while disadvantageous variantes are eliminated from the nature. This theory is also called a theory of ''survival of fittest''.

Q. 2. What is the modern interpretations of Darwin's theory known as?

Ans. The new theory or modern interpretations of Darwin's theory is known as **''Neo Darwinism''** or modern synthetic theory. Earlier Darwin gave the theory of *Natural Selection,* but later on, it was found that as the environment changes, the species adapt themself according to environment and after many generations the adapted characters lead to the alteration of the species into a new species which is called origin of species. Darwin although talked about the variation, but didn't have idea of sources of variation. After progress in genetics, these sources of variation were discovered and Darwin's theory of natural selection was modified to Neo-Darwinism or modern synthetic theory.

Q. 3. What are the two major contributions of Charles Darwin regarding evolution?

Ans. The two major contributions of Charles Darwin regarding evolution are his two theories viz.

1. Darwin's Theory of Natural Selection.
2. Neo-Darwinism or Modern Synthetic Theory.

In the first theory he stressed on the fact of natural selection and survival of the fittest. Although this theory still hold ground, but later on with the progress of genetics and discovery of sources of variations, this theory was modified to *Neo-Darwinism* or modern synthetic theory.

Q. 4. Give two main features of Neo-Darwinism?

Ans. The change in environment lead to new adaptations in the individual, which lead to origin of new species after many generations is called the theory of Neo-Darwinism.

The two main features of this theory:

1. The unit of evolution is **'population'** which has it's own gene pool. Gene pool is the group of all different genes of a population.
2. The heritable genetic changes appearing in the individuals of a population are the basis of evolution.

Q. 5. What do you mean by differential reproduction?

Ans. According to the theory of Neo-Darwinism the progressive adaptations lead to the origin of new

species after many generations and the individuals produce more offsprings with favourable genetic changes. This is called differential reproduction. This process of differential reproduction thereby helps in keeping the species distinct.

INTEXT QUESTIONS–4

Q. 1. Name the scientist who proposed
***(a)* Binomial nomenclature?**
***(b)* Five kingdom classification?**

Ans. ***(a)*** Binomial nomenclature means two name system of naming, of which the first part is of the genus followed by that of species e.g. Homo sapiens is the scientific name of modern man. This was proposed by **Carolus Linnaeus** who was Swedish biologist.

(b) R.H. Whittakar proposed in 1969 the 5 Kingdom Classification. The 5 kingdom are:

1. Monera, 2. Protoctista, 3. Fungi, 4. Plantae, 5. Animalae.

Q. 2. Which were the first organisms to appear on earth?

Ans. Bacteria were the first organisms to appear on the earth. They were having single chromosome without nuclear membrane. Due to the presence of this type of primitive nucleas, they are termed as Prokaryotes.

Q. 3. Name the taxonomic category which comes before and after family.

Ans. The taxonomic category which comes Before family is – Order, After family is – Genus followed by species.

Q. 4. Name the categories above order level in a correct sequence.

Ans. The categories above order level in correct sequence is as follows:

- Division
- Sub-division
- Class
- Sub-class

Then comes the order.

Q. 5. Rewrite the following:
(a)* Mangifera Indica – *Mangifer indica
(b)* Homo Sapiens – *Homo sapiens
(c)* Felis Leo – *Felis leo

Ans. *(a)* Mangifer indica, *(b)* Homo sapiens
(c) Felis leo

In the above examples the mistake was that species is always written in small letter and both names should be italics or underlined if hand written.

Q. 6. Place the following in their respective kingdoms?
***(a)* Bacteria which curdle milk**
***(b)* Cow**
***(c)* Grass**
***(d)* Amoeba**
***(e)* Bread mould**

Ans. *(a)* Bacteria which curdle milk – Monera
(b) Cow – Animalae
(c) Grass – Plantae
(d) Amoeba – Protista
(e) Bread mould – Fungi.

INTEXT QUESTIONS–5

Q. 1. With reference to viruses fill in the blanks (1, 2 and 3) in the following table:

1.	Tobacco	Tobacco Mosaic Disease
HIV	2.	AIDS
Herpes	human	3. ...

Ans. 1. Tobacco mosaic virus, 2. humans, 3. Herpes.

Q. 2. Give one feature because of which viruses are considered non-living.

Ans. Viruses possess nucleic acid, which is the genetic material as like living organisms, but they cannot make copies of their DNA for reproduction as their own. They can only make duplicate of their genetic material when they are inside the living cells. So they are regarded as non-living.

Q. 3. Name one chemical common to viruses and all other organisms.

Ans. Nucleic acid is the chemical common to virus and all other organisms. This nucleic acid is the genetic material used for reproduction.

Q. 4. Complete the following.
***(a)* Core particle of virus contains.....**
***(b)* Coat of the virus is made of .....**