**Olympiad tests relate to the following topicsin biology and chemistry:**

**BIOLOGY**
**The Living World (animals, plants, fungi, and lichens):**

* Levels of organization;
* Classification.

 **Cell Biology:**

* Levels of organization;
* Chemical Components of a Cell;
* Elements and inorganic compounds;
* Lipids, carbohydrates, proteins and nucleic acids colloidal systems;
* Cellular Metabolism;
* Enzymes;
* Energy production in glycolysis, Krebs cycle and terminal oxidation;
* Photosynthesises;
* The biosynthesis of lipids, carbohydrates, proteins and nucleic acids;
* Cellular Ultrastructure (Organelles), Cellular physiology, Membrane transport;
* Endocytosis and exostosis;
* The action potential cellular movements.

**Organic Biology:**

* Nutrition;
* Respiration;
* Excretion;
* Circulation Locomotion;
* Reproduction;
* Sexual an asexual reproduction growth and development;
* Regulation;
* Homeostasis and regulation by hormones;
* Nervous regulation;
* The nervous system;
* The synapse and neurotransmitters;
* Autonomic nervous system;
* The spinal cord;
* The brain;
* Memory and sleep;
* Perception;
* Receptors and perceptive organs;
* The evolution of the systems listed above;
* Structure and function of the corresponding human-organs;
* Animal behavior, innate and learned behavior;
* The Environment, Ecology, ecosystems;
* Food chains, limiting factors, cycles in nature;
* Populations and communities.

 **Genetics:**

* Molecular genetics;
* Properties of the genetic material;
* Mutation, recombination;
* The genetic code, the operon;
* Classical genetics;
* Modes of inheritance (discontinuous traits);
* Linkage;
* Sex chromosomes;
* Continuous traits genetic counselling.

 **Evolution:**

* Population, Specie, specie’s criteria;
* Population genetics;
* Chemical and biological evolution;
* Micro- and macroevolution, Human evolution;
* Biological progress and regress, adaptation as evolution’s result

**CHEMISTRY**
**General Chemistry:**

       Chemical reactions, types of chemical reactions;

       The structure of the atom. Isotopes;

       Electronic structure of the elements (quantum numbers, orbital, electronic configuration);

       Periodic table: atomic and ionic radii, ionization energy, electron affinity, electronegativity;

       Chemical bonds, the metallic, ionic and covalent bonds;

       Changes of state of the matter, gaseous, liquid and solid states;

       Gas phase. Important gas equations.

       Aqueous solutions, electrolytes and nonelectrolytes, acids and bases.

       Aqueous solutions. Calculations: concentration of solution, percent composition (by mass).

       The main classes of inorganic compounds. Complex compounds.

       Nomenclature of inorganic compounds. Common names.

       Double-replacement reactions. Equations: complete molecular, complete ionic and net ionic.

       Acidity of Basicity of aqueous salt solutions.

       Balancing redox reactions.

**Inorganic Chemistry:**

         Properties and reactions hydrogen and oxygen, compounds of hydrogen and oxygen;

         The halogens, compounds of the halogens;

         Nitrogen, phosphorous, and sulfur;

         Carbon, allotropic forms of carbon, inorganic compounds of carbon;

         The s- and p-block metals, transition metals.

**Organic Chemistry:**

         Covalent bonds of carbon, multiple covalent bonds in carbon compounds;

         Hydrocarbons: alkanes and cycloalkanes; alkenes and alkynes;

* Aromatic hydrocarbons, heteroaromatic compounds;
* Alcohols and ethers;
* Aldehydes and ketones;
* Carboxylic acids, calculation of acidity;
* Esters and anhydrides;
* Amines and amides;
* Halogen, sulfur, phosphorus containing compounds;
* Isomerism in organic chemistry, structural, geometrical and optical isomers.