GİRİŞ SINAVI KONULARI

BIOLOGY - topics for written part

Systematic Biology Protozoa, their subtyping and impact. Flagellata. Rhizopoda. Sporozoa. Ciliata. Porifera. Cnidaria and Acnidaria. Plathelminthes. Nemtahelminthes. Molluscs, Annelids, Arthropods, their characteristic and subtyping. Deuterostoma. Chordata, Vertebrata. Cyclostoma and Chondroichtyes. Fish. Amphibians. Reptiles. Mammals. Primates. Viruses. Bacteria.

General Biology and Genetics

The cell and its structure. The cell cycle. The cell division. The cell metabolism. The cell organelles, their structure and function. Chromosomes and their structure, number of chromosomes. Intra- and extranuclear DNA, their structure and function. RNA and its types, structure and function. The protein synthesis. The genetic code, Mendel's hybridization experiments and the rules of inheritance. Heritability of sex and sex-linked inheritance. The gene linkage. Polygenic inheritance. Human hereditary diseases. Spontaneous and induced mutations and mutagenic factors. The genetics of populations. The origin of the life on Earth and its evolution. The theory of Evolution, Ch.Darwin and his impact. The origin and evolution of the man, the main periods and human races. Sexual and asexual reproduction. Ontogenesis. Heterotrophy, autotrophy and mixotrophy. Photosynthesis. Ecology and basic ecological terms. The circulation of substances in the nature and the food-chain. Biotic and abiotic compounds of the environment. Characteristic of the ecosystem and possible ways of its evolution.

Biology of the Man

The bones, their structure and conjunction. The skeleton of the man. Voluntary and smooth muscles. The internal environment and the subtyping of body fluids. The blood, its composition, amount and function. The red blood cells, their shape, composition, function and lifetime. Leucocytes, their subtyping, quantity and function. Non-specific and specific immunity, immunization and vaccination. The blood groups and transfusion. The Rhesus-factor. The coagulation of blood. The human heart, its structure and function. The circulation of blood. The capillaries and the production of the tissue fluid. The control of blood circulation. The lymph and its circulation. The respiratory system of the man. The exchange of gases in the lungs and tissues. The breathing control. The digestive system of the man and the function of its particular parts. The digestion and digestive enzymes. Conversion of particular nutrients and the role of saccharides, lipids and proteins. The liver and its function. The optimal composition of the food according to quality and quantity.

Vitamins soluble in lipids and their impact. The B group vitamins, their function and avitaminosis manifestation. Vitamin C and its function, avitaminosis. The body temperature and its regulation. The kidneys and their function. The skin and its working. The endocrine glands. Insulin and its role. The adrenals and their hormones. The thyroid gland and its function. The parathyroid glands. The anterior and posterior lobe of the pituitary gland, their hormones and function. The neuron and its structure. The nervous impulse and its conduction. Conditioned and unconditioned reflexes. The involuntary nervous system and its function. The human brain, its structure and function of the particular parts. The olfaction. The taste. The skin perception. The sight, the eye, its structure and function. The vestibular apparatus. The man's hearing. The function of the ovaries and female sex hormones. The menstrual cycle. The pregnancy, the intrauterine development, placenta and its function, the labour. The function of the testes, male sex hormone and its effects. The periods of man's lifetime and their characteristic.

CHEMISTRY – topics for written part

The structure of the atom. Atomic mass. Principal chemical laws. Subatomic particles (electrons, protons, neutrons). General arrangement of electrons, protons and neutrons, atomic number. Isotopes. Arrangement of electrons in principal energy levels. Valence electrons. Electron-dot formulas of elements. Arrangement of the electrons in sublevels. Orbitals. The periodic classification of the elements. The periodic law. The periodic table, periods and groups. General characteristics of the groups. The structure of compounds, valence, oxidation number, ions, cations, anions, electrovalent or ionic bond, covalent bond, co-ordinate covalent bond, polyatomic ions and their formulas. The use of the periodic table for predicting oxidation numbers, properties, formulas and types of bonding in compounds. Structural formulas of molecules and polyatomic ions. Chemical nomenclature and properties of inorganic compounds, systematic chemical names. Binary compounds containing two nonmetals, binary compounds containing a metal and a non-metal, ternary and higher compounds. Acids, bases and salts. Calculations involving elements and compounds, mole, Avogadro's number, molar volume of a gas, empirical formulas, molecular formulas. Molecular mass (weight) or molecular formulas. Chemical equations. Calculations, involving chemical equations. Stoichiometry. Gases, liquids and solids. Water, polarity of water, hydrogen binding in water, chemical and physical properties of water, reactions of water, hydrates, hydrogen peroxide, ozone. Solutions and colloids. Types of solutions, solubility, concentrations of sulutions, colligative properties of solutions. Colloids. Acids, bases and ionic equations, definitions and properties of acids and bases. Bronsted-Lowry theory. pH and pOH, ionisation of water, electrolytes and nonelectrolytes. Oxidation-reduction equations and electrochemistry.

Definitions of oxidation and reduction, oxidising and reducing agents. Reaction rates and chemical equilibria. Reversible and irreversible reactions. Organic chemistry. Chemical nomenclature (IUPAC) and properties of organic compounds. Hydrocarbons. Classification of the hydrocarbons. Alkanes, alkenes, addition polymers, alkines. Aromatic hydrocarbons. Derivatives of the hydrocarbons. Organic halides, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, esters, amides, amines, amino acids, nitro-derivatives of the hydrocarbons. Heterocyclic compounds. Proteins, structure and properties. Carbohydrates, structure and properties. Isomerism, stereoisomerism, stereoisomers, cis-trans isomerism. Nucleosides, nucleotides, nucleic acids. Enzymes, hormones and vitamins. Lipids, properties and basic structures.

PHYSICS - topics for written part

Mechanical motion, types of the motion, trajectories, scalar and vector quantities, Newton laws of motion, quantity of motion, force, measurement of mass, centrifugal force, law of the energy conservation, momentum of force. Liquids - basic characteristics, Archimedes law, streaming of ideal liquid, continuity equation, pressure energy, Bernoulli equation. Gravitation, Newton gravitation law, gravitation field intensity, gravitation acceleration, gravitation potential. Electric field, electric charge, Coulomb law, electric field intensity, electric potential, electric voltage, capacity, capacitors. Molecular kinetic theory, thermodynamic temperature, specific heat, calorimeter, thermodynamic laws, ideal gas, isothermic, isochoric, isobaric and adiabatic processes, equation of state. Characteristics of solids, crystal lattices, deformations of solid bodies, characteristics of liquids, surface tension, expansivity of liquids, changes of state of matter. Electric current, conductors and insulators, electric conductivity of metals, Ohm law, electric resistance, electric circuits, semiconductors, electrolytes, electric current in gases, ionisation. Magnetic field, magnetic induction, magnetic field of a coil, magnetic induction current, electromagnetic induction, Faraday law of electromagnetic induction, Lenz law, electromagnetic oscillator, Thompson formula, oscillator resonance. Alternative current, circuits of alternative current with the resistance induction and capacity, rectifiers, amplifiers, power of alternative current, electromotors, transformers. Mechanical wave motion, interference of the wave motion, Huygens principle, sound and its characteristics, sound intensity, sound velocity, ultrasound, infrasound. Electromagentic wave motion, propagation of electromagnetic wave motion, types of electromagnetic wave motion, electroacoustic transducers. Light, light refracture, light reflection, refracture index, total reflection, optical systems, lenses, mirrors, microscopes, telescopes, wave properties of the light, dispersion, spectral colours, light interference, light diffraction, light polarisation, polarimeter, types of electromagnetic radiation, basic radiometric and photometric quantities. Introduction to the theory of relativity, connections

between mass and energy. Basic concepts of quantum physics, electron shells of atoms, Pauli principle, chemical bonds, atomic nucleus, nuclides, isotopes, mass decrement in an atomic nucleus, nuclear reactions, nuclear fusion and nuclear fission, nuclear reactors, natural and artificial radioactivity, kinetics of the radioactive decay, half life, decay constant.