

Appendix A

PROGRAMMES FOR THE QUESTIONS IN THE ADMISSION TESTS FOR THE DEGREE COURSES IN MEDICINE AND SURGERY

General culture and logical reasoning

To complete reasoning logically, consistent with the introduction pronounced in a symbolic or verbal form through multiple choice questions also formulated with short propositions, discarding the incorrect, arbitrary or less probable conclusions.

The questions will also be on scientific non-fiction or fiction by classic or contemporary authors, or texts of current affairs from newspapers or general or specialist magazines; they will also be on cases or problems, including those of an abstract nature whose solution requires the adoption of different forms of logical reasoning.

Questions relating to knowledge of general culture considered while at school complete this area of assessment.

Biology

The chemistry of living things

The bio-elements. The biological importance of weak interactions. Properties of water. Organic molecules in living organisms and the respective functions. The role of enzymes.

The cell as the basis of life

Cellular theory. Cell size. Prokaryote and eukaryote cells.

Cell membrane and its functions.

Cell structures and their specific functions.

Cell reproduction - mitosis and meiosis. Chromosomes.

Animal tissues.

Bio-energetics

The energy value of cells - ATP. ransporters of energy - NAD, FAD.

Oxide-reduction reactions in living beings. Photosynthesis. Glycolysis. Aerobic respiration.

Fermentation.

Reproduction and inheritance

Life cycles. Sexual and asexual reproduction.

Mendelian genetics. Basic laws and applications.

Classical genetics: chromosome theory of inheritance, sexual chromosomes, chromosome maps.

Molecular genetics - DNA and genes, genetic code and its translation, protein synthesis. DNA of prokaryotes. The chromosome of the eukaryotes. Regulation of gene expression.

Human genetics - transmission of mono and multi-factorial features, hereditary diseases.

New frontiers of genetics - recombinant DNA and its possible bio-technological applications.

Inheritance and environment

Mutations. Natural and artificial selection. Evolutionary theories. The genetic bases of evolution.

Anatomy and Physiology of animals and man

Anatomy of the main apparatus and the respective functions and interactions.

Homeostasis. Hormonal regulation.

Nerve impulse. Transmission and elaboration of information.

The immune response.

Chemistry

Constitution of matter: the states of aggregation of matter, heterogeneous and homogeneous systems, compounds and elements.

The structure of the atom: elementary particles, atomic number and mass number, isotopes, electronic structure of the atoms of different elements.

The Periodic Table of elements: groups and periods, elements of transition, periodic properties of the elements - atomic radius, ionisation potential, electronegativity, metals and non-metals, relations between electronic structure, position in the Periodic Table and properties.

The chemical bond: ionic bond, covalent bond, bond polarity, electro-negativity.

Foundations of inorganic chemistry: nomenclature and main properties of inorganic compounds - oxides, hydroxides, acids, salts, position in the Periodic Table.

Chemical reactions and stoichiometry: atomic and molecular weights, Avogadro constant, the mole concept, conversion from grams to mole and vice versa, elementary stoichiometric calculations, balancing simple reactions, various types of chemical reactions.

Solutions: solvent properties of water, solubility, main ways of expressing the concentration of solutions.

Oxidation and reduction: oxidation number, concept of oxidant and reducing agent.

Acids and bases: concepts of acids and bases, acidity, neutrality, basicity of aqueous solutions, pH.

Foundations of organic chemistry: links between carbon atoms, rough structure and rational formulae, isomeric concept, aliphatic, alicyclic and aromatic hydrocarbons, functional groups - alcohols, ethers, amines, aldehydes, ketones, carboxylic acids, esters, amides.

Physics

Measurements: direct and indirect measurements, basic and derived size, physical dimensions of size, knowledge of the decimal metric system and the CGS, Technical (or Practical) (TS) and International (IS) Units of Measurement Systems, units of measurement (names and relations between basic and derived units), multiples and sub-multiples (names and values).

Kinematics: kinematic size, various types of motion with special attention to uniform and uniformly accelerated rectilinear motion, uniform circular motion, harmonic motion (for all types of motion - definition and relations between connected kinematic size).

Dynamics: vectors and operations on vectors. Force, moments of force with respect to a point. Vectorial composition of force. Definitions of mass and weight. Acceleration of gravity. Density and specific weight. Law of universal gravitation, 1st, 2nd and 3rd laws of dynamics. Work, kinetic energy and potential energy. Law of energy conservation.

Fluid mechanics: pressure and its units of measurement (not just in the IS system). Archimedes' principle. Pascal's law. Stevino's law.

Thermodynamics: thermometry and calorimetry. Specific heat, heat capacity. Mechanisms for the propagation of heat. Changes of state and latent heat. Ideal gas laws. First and second principle of thermodynamics.

Electrostatics and electrodynamics: Coulomb's law. Electric field and potential. Dielectric constant. Capacitors. Series and parallel capacitors. Direct current. Ohm's law. Electrical resistance and resistivity, Series and parallel electrical resistance. Work, Power, Joule effect. Generators. Electromagnetic induction and alternating current. Effects of electrical current (thermic, chemical and magnetic).

Mathematics

Algebra and numerical sets: natural, whole, rational and real numbers. Sorting and comparison, size order and scientific notation. Operations and their properties. Proportions and percentages. Powers with whole and rational exponents) and their properties. Roots and their properties. Logarithms (on a base of 10 and base of e) and their properties. Notes on combinatorics. Algebraic and polynomial expressions. Significant products, power to the n of a binomial, factorisation of polynomials. Algebraic fractions. Algebraic equations and inequalities of first and second degree. Equations systems.

Functions: fundamental notions of functions and their graphic images (domain, codomain, signum, maxima and minima, increasing and decreasing, etc.). Elementary functions: whole and fractional algebraic functions, exponential, logarithmical, and goniometrical. Compound and inverse functions. Equations and goniometric inequality.

Geometry: polygons and their properties. Circumference and the circle. Measurement of length, surface and volume. Isometry, similitude and equivalence on the plane. Geometrical places. Measurement of angles in degrees and radians. Sine, cosine and tangent of an angle and their significant figures. Goniometric formulae. Resolution of triangles. Cartesian Co-ordinate System in a plane. Distance of two points and the midpoint of a segment. Equation of a straight line. Conditions of parallelism and perpendicularity. Distance of a point from a straight line. Equations of the circumference, parabola, hyperbola and ellipse and their representation in the Cartesian plane. Pythagoras' Theory.

Probability and statistics: distribution of frequency according to type of character and main graphic descriptions. Notion of random experiment and event. Probability and frequency.