Dr A S RAO AWARDS COUNCIL

SYLLABUS FOR SCIENCE TALENT SEARCH EXAMINATION (30-STSE) - 2017

9th Class MATHEMATICS:

(1) **REAL NUMBERS:** Real number representation on number line, operations on real numbers.

(2) **POLINOMIALS AND FACTORIZATION:** Polynomial in one variable; degree, zeros of polynomial, dividing polynomials, factorizing polynomial, algebraic identities.

(3) **ELEMENTS OF GEOMETRY:** Euclid's elements of geometry, Axioms and postulates, non-Euclidian geometry.

(4) **LINES AND ANGLES:** Intersecting, non-intersecting and concurrent lines, pairs of angles, linear pair of angles axiom, angles in intersecting lines, lines and a transversal, lines parallel to same line, Angle sum property of a triangle.

(5) **LINEAR EQUATIONS IN TWO VARIABLES:** Solution, graph of linear equation, equation of lines parallel to X-axis and Y-axis.

(6) **TRIANGLES:** Congruence, criteria and rules for triangles, properties of a triangle, inequalities in a triangle.

(7) **QUARDRIALATERALS:** Types of quadrilaterals; parallelogram, diagonals and properties, of parallelogram, midpoint theorem of triangle, diagonals.

(8) **STATISTICS:** Collection and representation of data, measures and deviation of values of central tendency, arithmetic mean, mean of raw data, mean of ungrouped frequency distribution, and deviation method, median, median of frequency distribution, mode.

(9). **SURFACE AREAS AND VOLUMES:** Surface area of cuboids, volume and capacity, right circular cylinder, curved, total surface areas and volume of cylinder, right circular cone, curved and total surface areas of cone, volume of right circular cone, sphere, hemisphere.

(10**).AREAS:** Area of planar regions, area of rectangle, figures on same line and between same parallels, parallelograms on same base and between same parallels, triangles on same base and between same parallels.

(11) **CIRCLES:** Angle subtended by a chord at a point on circle, perpendicular from center to a chord, three points to describe a circle, chords and their distance from center of circle, angle subtended by an arc of circle, angle subtended by arc at a point on circle, cyclic quadrilateral.

9th Class PHYSICS

(1). MOTION: Distance, Displacement, Speed, velocity, Average speed, average velocity, uniform and non-uniform motion, Uniform circular motion, Motion of object thrown up, Acceleration, equations of motion with uniform acceleration.

(2) LAWS OF MOTION: Newton's laws of motion, Inertia and mass, Linear momentum, Force, Forces acting on springs connected, Forces acting on two or more bodies connected, Conservation of momentum & Impulse.

(3).GRAVITATION: Motion in circular path, Universal law of gravitation, acceleration due to gravity, Weight, weight of a freely falling body, Centre of gravity(C.G), Location of C.G. of object of different shapes, effects of shifting of C.G.

(4) FLOATING BODIES: Density and relative density, relative density of liquids, Lactometer, Upward force in liquids, atmospheric pressure and measurement, Pressure at different depts. In liquid, Force of buoyancy, Archimedes's principle, Pascal's principle.

(5). WORK AND ENERGY : Mechanical energy and its conservation principle, Energy of free fall at different heights, power, Different sources of energy(solar, biomass , tidal, geo thermal wind and atomic energy.

(6) REFRACTION OF LIGHT AT PLANE SURFACES: Laws of refraction, Refractive index, Relative refractive index, Snell's law, Total internal and applications, Refraction through glass slab.

(7) ATOMIC STRUCTURE: Rutherford's alpha particle scattering experiment, atomic mass number, isotopes and their applications.

9th Class CHEMISTRY

(1).STATES OF MATTER AND PROPERTIES: States of matter and properties, diffusion and how its take place in gases, liquids and solids, attraction between particles, effect of Temperature & Pressure on change of state, evaporation and effects of surface area, humidity and wind speed.

(2). **IS MATTER PURE**: Types of mixtures, solutions and properties, concentration of solution, Saturated and unsaturated solutions and preparation, factors effecting rate of dissolving, suspensions and colloidal solutions, separation of components of mixture, process of evaporation of water, separation of immiscible and miscible liquids, distillation, separation of two miscible liquids, mixtures and compounds, types of pure substances.

(3). **ATOMS, MOLECULES AND CHEMICAL REACTIONS:** Laws of conservation of mass proportions, Dalton's atomic theory, elements with more than one atom in molecules, atomicity, valency, Ion, atomic mass, molecules of compounds, molecular mass and mole concept, Types of chemical reactions (combination, decomposition, displacement, double displacement, oxidation and reduction reactions), oxidation reactions in daily life, Rancidity.

(4) ATOMIC STRUCTURE: Sub atomic particles, Thomson's model of atom, Rutherford's model of atom, Bhor's atomic model, valency, electron shells.

9th Class BIOLOGY

(1) STRUCTURE AND FUNCTIONING OF CELL: Typical cell, cell membrane, nucleus, cytoplasm, cell organelles, endoplasmic reticulum(ER), Lysosome, Mitochondria, Ribosomes, Plastids, are cells flat, where do cells come from.

(2) TISSUES OF PLANTS AND ANIMALS:: Parts of plants and their function, Meristematic tissues, dermal tissue, ground tissue, vascular tissue, Epithelial tissue, connective tissue, story of blood, identification of blood group, muscle tissue, nervous cells.

(3) PLASMA MEMBRANE: smosis and its importance to living organisms, functions of plasma membrane, Diffusion, effect of different solutions on blood

(4) DIVERSITY IN LIVING ORGANISMS: Diversity in plants, diversity in animals, variations in plants, need of classification, classification and evolution, classification done till date, Monera, Protista, characteristics of Protists, Fungi and its characteristics, classification of animals, porfera, cnidarians, platyhelminthes, nematode, annelid, arthropoda, mollusca, echinodermata, protochordata, chordeta, vertebrata and vertebrates.

(5) SENSE ORGANS: Stimulation to sensation, our sense organs and their structure and functioning(Eye, Ear, Nose, Tongue, Skin)

(6) BEHAVIOR OF ANIMALS: Animal behavior and types, human behavior and types, investigating behavior, animal intelligence.

(7) IMPROVING AGRICULTURAL PRODUCTS: How to increase food production, irrigation, uses of water for plants, relationship between water and crop yield, plant nutrients, soil nutrients, crop rotation, mixed crops, organic manure, green manure crops, soil testing, vermin compost, panchgavya, organic farming, bio fertilizers, chemical fertilizers, crop protection, insects and plant diseases, natural pest controlling methods, hybridization.