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## **Ramakrishna Mission Vidyalaya**

(A Residential School for boys with H. S. Section)

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### **Revised Syllabus for Aptitude Test of Class XI**

#### **Physics**

1. Dimensional analysis
2. Mechanics: Linear Motion, Projectile Motion, Scalars and Vectors, Newton's Laws of Motion, Work, Power and Energy.
3. Newton's Law of Gravitation.
4. Properties of Matter:
5. Elasticity, Surface tension, Viscosity, Bernoulli's, theorem, Hydrostatics.
6. Heat:
7. Thermometry, Calorimetry, Change of state, First Law of Thermodynamics, Thermal expansion, Conduction of Heat.
8. Light:
9. Reflection, Refraction, Scattering, Electromagnetic wave.
10. Electricity:
11. Coulomb's Law, Ohm's Law, Resistance, Series and Parallel combinations of Resistances and Cells, Joule's Law of electrical heating, Power, Electromagnetism, Electromagnetic induction.
12. Radioactivity, Nuclear energy, Nuclear fission, Nuclear Fusion.

#### **Mathematics**

1. Number system.
2. Ratio-proportion, Variation, Factorization upto the form:  $(a^3 + b^3 + c^3 - 3abc)$
3. Laws of indices, Surds, Logarithm, Theory of Quadratic Equation.
4. Coordinate Geometry (Basic Coordinates, Distance Formula, Section Formula, Area of Triangle, Quadrilateral and Locus).
5. Polynomials (Remainder Theorem and Factor Theorem), Function.
6. Profit-loss, Interests (Simple & Compound), Uniform Rate of Change, Partnership Business.
7. Statistics: Graphical Representation, Mean, Median, Ogive, Mode.
8. Plane Geometry: Theorems of Concurrency, Circle Theorems, Theorems on Tangents, Similarity Theorems.
9. Surface Area, Volume of Solid Objects: Cuboid, Cylinder, Sphere, Cone.
10. Mensuration: Perimeter and Area of Triangles, Quadrilateral, Circles.
11. Set Theory (Laws, Set Operations, Application).
12. Concept of Probability (Classical Definition).
13. Trigonometry (Identities, Applications, Associated Angles).

#### **Chemistry**

1. Atomic structure (Thomson Model, Bohr's Model, Sommerfeld's Model, Orbital electronic configuration, Wave mechanics (radial distribution function, Nodes))
2. Periodic Table (Periodic trends, Calculation of effective nuclear charge, Ionization potential, Electronegativity, Electron affinity)
3. Chemical bonding (Electrovalent bonding, Concept of lattice energy, Comparison of lattice energy and Solvation energy and Solubility, Covalent bonding, Co-ordinate covalent bonding, Concept of hybridization (non-equivalent hybridisation), VSEPR Theory, H-Bonding, Dipole moment)
4. Mole concept and Stoichiometry, Limiting reagent, Eudiometry.
5. Red-ox and Equivalent weight.