Deck Cadet Entrance Exam

SYLLABUS

Total marks: 100
Duration: 120 minutes
Level : XII (Science)

S.NO	SUBJECT
1	**ENGLISH** • Sentence Completion • Grammar • Vocabulary • Comprehension
2	**MATHEMATICS** **Number and operations** • Operations, ratio and proportion, averages, percentage, elementary number theory, fractions and decimals, sequences (Arithmetic Mean only,) **Algebra and functions** • Expressions (up to cubic level), equations (up to quadratic level), properties of functions (linear, polynomial, rational) **Geometry and mensuration** • Plane Geometry (Lines and angles, triangles, square, rectangle, parallelogram, trapezium, rhombus, quadrilaterals and other polygons restricted to 4 sided figures, circles) • Co-ordinate Geometry (Lines and circles) • Three-dimensional Solids (Surface area and volume of cubes, cylinders, cones, spheres and combination of shapes) **Trigonometry** • Application questions calculation of height and distances • Right triangles, identities including expressing trig functions in terms of their complements and identities for negative angles • Periodicity of trignometric functions • Double angle formulas for sine and cosine • Pythagorean formula for sines and cosines
3	**PHYSICS** **Mechanics** **Kinematics**, such as velocity, acceleration, motion in one dimension. • **Dynamics**, such as force, Newton's laws, statics, and friction • **Energy and Momentum**, such as potential and kinetic energy, work, power, impulse, and conservation laws • **Circular Motion**, such as uniform circular motion and centripetal force • **Simple Harmonic Motion**, such as pendulum • **Gravity**, such as the law of gravitation, orbits, and Kepler's laws

S.NO	SUBJECT
	Electricity and magnetism • **Electric Fields, Forces, and Potentials**, such as Coulomb's law, induced charge, field and potential of groups of point charges, and charged particles in electric fields • **Capacitance**, such as parallel-plate capacitors and time-varying behavior in charging/discharging • **Circuit Elements and DC Circuits**, such as resistors, light bulbs, series and parallel networks, Ohm's law, and Joule's law • **Magnetism**, such as permanent magnets, fields caused by currents, particles in magnetic fields, Faraday's law, and Lenz's law **Waves and optics** • **General Wave Properties**, such as wave speed, frequency, wavelength, superposition, standing wave diffraction, and Doppler effect • **Reflection and Refraction**, such as Snell's law and changes in wavelength and speed • **Ray Optics**, such as image formation using pinholes, mirrors, and lenses **Heat and thermodynamics** • **Thermal Properties**, such as temperature, heat transfer, specific and latent heats, and thermal expansion • **Laws of Thermodynamics**, such as first and second laws, internal energy, entropy, and heat engine efficiency **Miscellaneous** • Hydrostatics • Simple hydraulics (Pascal's law)
4	**CHEMISTRY** **States of matter** • **Gases**, including the kinetic molecular theory, Charles law, Boyle's law, the gas laws / relationships, molar volumes, density. • **Liquids and Solids** **Reaction types** • The chemistry of acids and bases • Conjugate acid- base pairs • Acid –base reactions
5	**GENERAL KNOWLEDGE** • Geography (Capitals, Oceans, Ports, Waterways, produce of countries, weather etc.)
6	**APTITUDE** • Qualitative reasoning • Quantitative reasoning • Abstract reasoning) • Spatial reasoning • Logical reasoning