

Deck Online Entrance Test and Interview



SYLLABUS

Total marks: 100

Duration: 120 minutes

S.No.	Subject
1.	English <ul style="list-style-type: none">• Sentence Completion• Grammar• Vocabulary• Essay writing (300 words) at the time of the interview.
2.	Mathematics <u>Number and operations</u> <ul style="list-style-type: none">• Operations, ratio and proportion, averages, percentage, elementary number theory, fractions and decimals.• Squares and square roots, cubes and cube roots, exponents and powers, H.C.F. and L.C.M.• Arithmetic Progressions, n^{th} term, sum of first n terms of A.P. and their application in solving problems. <u>Algebra and functions</u> <ul style="list-style-type: none">• Expressions (up to cubic level), equations (up to quadratic level), properties of functions (linear, polynomial, rational) <u>Linear Equations in Two Variables</u> <ul style="list-style-type: none">• Focus on linear equations of the type $ax + by + c = 0$• Applications in solving problems <u>Geometry and mensuration</u> <ul style="list-style-type: none">• Plane Geometry (Lines and angles, triangles, squares, rectangles, parallelogram, trapezium, rhombus, quadrilaterals and circles)• Co-ordinate Geometry (Lines and circles)• Three-dimensional Solids (Surface area and volume of cubes, cylinders, cones, spheres and combination of shapes) <u>Trigonometry</u> <ul style="list-style-type: none">• Trigonometric ratios of an acute angle of a right-angle triangle.• Heights and Distances: Angle of elevation, angle of depression and problems based on these. <u>Permutations and Combinations</u> <ul style="list-style-type: none">• Fundamental principle of counting.• Factorial n. ($n!$), Permutations (${}^n P_r$) and Combinations (${}^n C_r$), simple applications <u>Probability</u> <ul style="list-style-type: none">• Events; occurrence of events, Probability of an event and related problems• Bayes' theorem
3.	General Knowledge <ul style="list-style-type: none">• Geography (Capitals, Oceans, Ports, Waterways, produce of countries etc.)
4.	Aptitude <ul style="list-style-type: none">• Qualitative reasoning• Quantitative reasoning,• Abstract reasoning,• Spatial reasoning,• Logical reasoning

5.	<p><u>Physics Mechanics</u></p> <ul style="list-style-type: none"> • Kinematics, such as velocity, acceleration and 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 • Gravitation, such as the Universal law of gravitation, Kepler's laws, force of gravitation of the earth (gravity), acceleration due to gravity, mass and weight. <p><u>Electricity and magnetism</u></p> <ul style="list-style-type: none"> • 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. <p><u>Waves and optics</u></p> <ul style="list-style-type: none"> • General Wave Properties, such as wave speed, frequency, wavelength, superposition, standing wave diffraction, Doppler effect and Young's double slit experiment. • 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. <p><u>Heat and thermodynamics</u></p> <ul style="list-style-type: none"> • Thermal Properties, such as temperature, heat transfer, specific and latent heat, and thermal expansion • Laws of Thermodynamics, such as first and second laws, internal energy, enthalpy, entropy, and heat engine efficiency <p><u>Floatation</u></p> <ul style="list-style-type: none"> • Thrust and pressure, Archimedes' Principle, Buoyancy <p><u>Mechanical properties of Solids</u></p> <ul style="list-style-type: none"> • Stress-strain relationship, Hooke's law, Young's modulus, Poisson's ratio. <p><u>Mechanical properties of fluids</u></p> <ul style="list-style-type: none"> • Pressure due to a fluid column; Pascal's law and its applications, effect of gravity on fluid pressure. Viscosity, Stokes' law, streamline and turbulent flow, Bernoulli's theorem and its applications. <p><u>Thermal properties of matter</u></p> <ul style="list-style-type: none"> • Heat, temperature, thermal expansion. • Heat transfer – conduction, convection and radiation, Stefan's law
6.	<p><u>Chemistry</u></p> <p><u>Structure of Atom</u></p> <ul style="list-style-type: none"> • Atomic number, isotopes and isobars • De Broglie's equation, Heisenberg uncertainty principle <p><u>States of Matter</u></p> <ul style="list-style-type: none"> • Gases, including the kinetic molecular theory, Charles law, Boyle's law, the gas laws/relationships, molar volumes and density. • Liquids and Solids <p><u>Materials</u></p> <ul style="list-style-type: none"> • Metals and Non-metals <p><u>Reaction types</u></p> <ul style="list-style-type: none"> • The chemistry of acids, bases and salts • Conjugate acid-base pairs <p><u>Periodic table</u></p> <ul style="list-style-type: none"> • Present form of the periodic table • Periodic trends in properties of elements – atomic radii, valency etc.