

UPTU 2018 Syllabus PAPER – 4 (APTITUDE TEST FOR ARCHITECTURE)

Part A: Mathematics

- **Algebra:** Sets relations & functions, De-Morgan's Law, Mapping Inverse relations, Equivalence relations, Peano's axioms, Definition of rationals and integers through equivalence relation, Indices and surds, Solutions of simultaneous and quadratic equations, A.P., G.P. and H.P., Special sums i.e. $\sum n^2$ and $\sum n^3$ ($n \in \mathbb{N}$), Partial fraction, Binomial theorem for any index, exponential series, Logarithm and Logarithmic series. Determinants and their use in solving simultaneous linear equations, Matrices, Algebra of matrices, Inverse of a matrix, Use of a matrix for solving equations.
- **Probability:** Definition, Dependent and independent events, the Numerical problem on addition and multiplication, the theorem of probability.
- **Trigonometry:** Identities, Trigonometric equations, properties of triangles, the solution of triangles, heights and distances, Inverse function, Complex numbers and their properties, Cube roots of unity, De-Moivre's theorem.
- **Co-ordinate Geometry:** Pair of straight lines, Circles, General equation of second degree, parabola, ellipse and hyperbola, tracing of conics.
- **Calculus:** Limits & continuity of functions, Differentiation of function of function, tangents & normal, Simple examples of Maxima & Minima, Indeterminate forms, Integration of function by parts, by substitution and by partial fraction, definite integral, application to volumes and surfaces of frustums of sphere, cone and cylinder. Differential equations of first order and of the first degree.
- **Vectors:** Algebra of vectors, scalar and vector products of two and three vectors and their applications.
- **Dynamics:** Velocity, a composition of velocity, relative velocity, acceleration, the composition of accelerations, Motion under gravity, Projectiles, Laws of motion, Principles of conservation of momentum and energy, a direct impact of smooth bodies.
- **Statics:** Composition of coplanar, concurrent and parallel forces moments and couples resultant of set of coplanar forces and condition of equilibrium, determination of centroid in simple cases, Problems involving friction.

Part B: Aesthetic sensitivity

- Aesthetic sensitivity Test is aimed to evaluate a candidate for aesthetic Perception, Imagination, and Observation; Creativity and Communication and Architectural awareness.
 - Visualizing three-dimensional objects from two-dimensional drawings.
 - Visualizing different sides/surfaces of three-dimensional objects.
 - Identifying commonly used materials and objects based on their textural qualities.
 - Analytical Reasoning.

- Mental Ability.
- Imaginative comprehension and expression.
- Architectural awareness.

Part C: Drawing Aptitude

- The Drawing Aptitude Test is aimed to evaluate a candidate for his understanding of Scale and Proportion, the sense of perspective, colour and; understanding of the effects of light on objects through shades and shadows.
 - Ability to sketch a given object proportionately and rendering the same in visually appealing manner.
 - Visualising and drawing the effects of light on the objects and their shadow cast on the surroundings.
 - The sense of Perspective Drawing.
 - Combining and composing given three-dimensional elements to form a building or structural form.
 - Creating interesting two-dimensional compositions using given shapes or planner forms.
 - Creating visual harmony using colours in given composition.
 - Understanding of scale and sense of proportion.