UPTU 2018 Syllabus PAPER – 10 (APTITUDE TEST FOR MCA)

(i) MATHEMATICS

- **Modern Algebra:** Idempotent law, identities, complementary laws, Demorgan's theorem, mapping, inverse relation, equivalence relation, Piano's Axiom, a definition of rational numbers and integers through equivalence relation.

- **Algebra:** Surds, the solution of simultaneous and quadratic equations, arithmetic, geometric and harmonic progression, Binomial theorem for any index, logarithms, exponential and logarithmic series, determinants.

- **Probability:** Definition, dependent and independent events, numerical problems on addition and multiplication of probability, theorems of probability.

- **Trigonometry:** Simple identities, trigonometric equations, properties of triangles, use of mathematical tables, the solution of triangles, height and distance, inverse functions, DeMoiver's theorem.

- **Co-Ordinate Geometry:** Co-ordinate geometry of the straight lines, the pair of straight lines, circle, parabola, ellipse and hyperbola and their properties.

- **Calculus:** Differentiation of function of functions, tangents and normal, simple examples of maxima of minima, limits of function, integration of function (by parts, by substitution and by a partial fraction), definite integral (application to volumes and surfaces of frustums of sphere, cone and cylinder).

- **Vectors:** Position vector, addition and subtraction of vectors, scalar and vector products and their applications.

- **Dynamics:** Velocity, a composition of velocity, relative velocity, acceleration, the composition of acceleration, motion under gravity, projectiles, laws of motions, principles of conservation of momentum and energy, the direct impact of smooth bodies, pulleys.

- **Statics:** Composition of co-planar, concurrent and parallel forces, moments and couples, resultant of set of coplanar forces and conditions of equilibrium, determination of Centroides in a simple case, problems involving friction.

(ii) STATISTICS

- Theory of probability, Mean, Median, Mode, Dispersion and Standard Deviation.

(iii) LOGICAL ABILITY

- Questions to test analytical and reasoning capability of candidates.