Test Code: DUAT02

Programme: MSc Computer Science with specialization Data Analytics

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Programme: MSc Data Science & Computational Modelling

Question type	Syllabus
General Aptitude 20 Marks	**Verbal Aptitude-**Basic English grammar: Tenses, articles, adjectives, prepositions, conjunctions, verb-noun agreement, and other parts of speech. Basic vocabulary: Words, idioms, and phrases in context. Narrative sequencing. **Quantitative Aptitude-**Data interpretation: Data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables. Numerical computation and estimation: Ratios, percentages, powers, exponents and logarithms, permutations and combinations, summations and series, Mensuration and Geometry **Analytical Aptitude-** Logic: Deduction and induction, analogy, numerical relations, and reasoning **Spatial Aptitude-**Transformation of shapes: Translation, rotation, scaling, mirroring, assembling, grouping, paper folding, cutting, and patterns in 2 and 3 dimensions.
Basic Mathematics 30 Marks	**Set Theory-**Concept of sets – Union, Intersection, Cardinality, Elementary counting; permutations and combinations. **Probability and Statistics-**Basic concepts of probability theory, Averages, Dependent and independent events, frequency distributions, measures of central tendencies and dispersions. **Algebra-**Fundamental operations in algebra, expansions, factorization, simultaneous linear /quadratic equations, indices, logarithms, arithmetic, geometric and harmonic progressions, determinants and matrices. **Coordinate Geometry-**Rectangular Cartesian coordinates, distance formulae, equation of a line, and intersection of lines, pair of straight lines, equations of a circle, parabola, ellipse and hyperbola. **Calculus-**Limit of functions, continuous function, differentiation of function, tangents and normal, simple examples of maxima and minima. Integration of functions by parts, by substitution and by partial fraction, definite integrals, applications of definite integrals to areas.

	Vectors-Position vector, addition and subtraction of vectors, scalar and vector products and their applications to simple geometrical problems and mechanics. **Trigonometry-**Simple identities, trigonometric equations, properties of triangles, solution of triangles, heights and distances, general solutions of trigonometric equations.
BSc level questions 10 Marks	**Computer Basics**: Organization of a computer, Central Processing Unit (CPU), structure of instructions in CPU, input/output devices, computer memory, and back-up devices. **Data Representation**: Representation of characters, integers and fractions, binary and hexadecimal representations, binary arithmetic: addition, subtraction, multiplication, division, simple arithmetic and two's complement arithmetic, floating-point representation of numbers, Boolean algebra, truth tables, Venn diagrams.