DELHI TECHNOLOGICAL UNIVERSITY

Established by Govt. of Delhi vide Act 6 of 2009
(FORMERLY DELHI COLLEGE OF ENGINEERING)
BAWANA ROAD, DELHI-110042

No. F.DTU/Rectt./AM/AP/2016 Dated: 02/12/2016

NOTICE

General Instructions and syllabus for screening test for the post of Assistant Professors on regular basis in the discipline of Applied Mathematics, Mathematics & Computing, Applied Physics and Engineering Physics.

SYLLABUS

For Applied Mathematics: Syllabus of GATE 2016 of Mathematics.

For Applied Physics & Engineering Physics: Syllabus of GATE 2016 of Physics.

For Mathematics & Computing: As under:-

Set, relation and function. Derivative and its applications. Definite integral and its applications. Sequences and series. First and second order linear differential equations with constant coefficients. Determinants, matrices. Laplace Transform. Fourier Series. Functions of several variables, Partial derivative and its applications.

Multiple integrals and their applications. Differential equation with variable coefficients, series solution of differential equations. Formation of partial differential equations, Lagrange's equation, Charpit's method, wave equation, heat equation. Differential and Integral vector calculus. Functions of complex variables, analytic function, conformal mapping, complex integration, Taylor series, Laurent series and the Residue theorem. Numerical solution of algebraic and transcendental equations. Numerical differentiation and Integration. Iterative method for solution of system of simultaneous linear equations, numerical methods for solution of ordinary differential equations. Finite dimensional vector spaces, Linear transformation and their matrix representation, Cayley-Hamilton Theorem, Hermitian, skew hermitian and unitary matrices. Inner product space, Metric space, Completeness, Weierstrass approximation theorem, compactness .Group, sub group, Normal subgroup, cyclic group ,Homomorphism , Isomorphism. Rings and their homomorphism, Ideal. Basic concepts of topology, product topology, connectedness , countability and separation axioms, compactness.

Programming fundamental & C/C++ Programming , Object oriental programming concepts using C++/Java. **Data Structures & algorithms** : Analysis algorithms, arrays, stack, queues, linked lists, trees, Binary search tree, Graphs, Sorting and searching, Algorithm design using Greedy, Dynamic Programming, branch and bound, backtracking, Complexity theory.
Digital logic design: Boolean algebra, logic functions, combinational & sequential circuit design, registers and counters, logic families. **Computer organization & architecture**: Introduction, CPU design, control unit design, memory organization, I/O devices, Computer Network-OSI, TCP/IP, Brief overview at OSI layers, IPv4, IPv6.**Cryptography and network Security**: Traditional, Symmetric and symmetric cryptography, modulo arithmetic, Authentication & Hash functions, IP and Network Security Protocols like PGP,S/MIME, SET, IPSec, SSL, TLS, VPN. **Database Management Systems**: Basic concepts, models and Languages, Database design and normalization, file organization, transaction Processing, concurrency control. **Theory of Computation:** Regular expression, Finite automata, context free grammar, pushdown automata, Turing machines. **Operating system**: Types, system structure, process management, CPU scheduling, deadlocks, memory management, I/O management, disk scheduling, file systems.

Computer graphics: Line, circle, ellipse drawing algorithms, line and polygon dipping, arc filling, curves and surfaces, transformations, projections.

Probability space, conditional probability, Baye's Theorem. Expectation and moments. Joint and conditional distributions. Binomial, Poisson, hypergeometric, normal and exponential distributions and their applications. Hypothesis testing, Large and exact sampling. Linear programming problem, simplex method, transportation and assignment problems. Basics of financial mathematics, Derivative securities, Forward price formula, future pricing, value of commodity swap, Basics of option pricing and portfolio optimization. Propositional and predicate logic, Normal forms, theory of inference, Lattice and Boolean algebra. Basic concepts of graphs, connectivity, path and circuits, shortest path algorithms, tree, Spanning tree, planar graph and coloring, cut vertices and edges.

Tentative date of screening test: 31.12.2016 & 01.01.2017
The detailed time and schedule of screening test will be displayed on University website in due course of time.

Sd/-
Registrar