INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN
(ESTABLISHED BY GOVT. OF DELHI VIDE ACT 09 OF 2012)
KASHMEREGATE, DELHI-110006.

SCHEME OF EXAMINATION FOR THE POST OF ASSISTANT PROFESSOR IN COMPUTER SCIENCE AND ENGINEERING /INFORMATION TECHNOLOGY IN IGDTUW, DELHI

With reference to the Recruitment Notice No. IGDTUW/Recruitment/2023/1, the Scheme of Examination for the post of Assistant Professor in Computer Science and Engineering/Information Technology in IGDTUW, Delhi as under:

All the Questions are Objective Type (MCQ) and carry one mark each without any negative marking for wrong answer.

PART A (WRITTEN TEST)	Duration:	2 Hours
	Total Questions:	100
	MaximumMarks	100 (1 Mark per Question) There is no negative marking for wrong answer.
PART B (INTERVIEW)		

SYLLABUS FOR WRITTEN TEST

Engineering Mathematics
Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Monoids, Groups. Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions.
Linear Algebra: Matrices, determinants, system of linear equations, eigenvalues and eigenvectors, LU decomposition.
Calculus: Limits, continuity and differentiability. Maxima and minima. Mean value theorem. Integration.
Probability and Statistics: Random variables. Uniform, normal, exponential, poisson and binomial distributions. Mean, median, mode and standard deviation. Conditional probability and Bayes theorem.

Programming and Data Structures
Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Algorithms
Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph traversals, minimum spanning trees, shortest paths

Operating System
System calls, processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU and I/O scheduling. Memory management and virtual memory. File systems.

Data bases
ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Computer Networks
Concept of layering: OSI and TCP/IP Protocol Stacks; Basics of packet, circuit and virtual circuit switching;
Data link layer: framing, error detection, Medium Access Control, Ethernet bridging; Routing protocols: shortest path, flooding, distance vector and link state routing; Fragmentation and IP addressing, IPv4, CIDR notation, Basics of IP support protocols (ARP,DHCP, ICMP), Network Address Translation (NAT); Transport layer: flow control and congestion control, UDP, TCP, sockets;
Application layer protocols: DNS, SMTP, HTTP, FTP, Email.

Theory of Computation
Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undesirability.

Compiler Design
Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediatecode generation. Local optimisation, Data flow analyses: constant propagation, liveness analysis, common subexpression elimination.

Emerging Trends

Python Fundamentals, Libraries for ML, Supervised and Unsupervised Learning, Machine Learning libraries: Scipy, Numpy, Matplotlib

Data split and hyper-parameter training, Pre-processing data and feature engineering, Exploratory Data analysis using Visualization, Different types of Regression-Linear and Logistic Naive-Bayes' Classification, SVM Classification Deep Learning, CNN, RNN

Cyber Security Fundamentals, Threat Actors, Attacks, and Mitigation, Security Policies and Procedures, Information Security Governance, Risk Management, Incident Management, Digital Forensics.