गति शक्ति विश्वविद्यालय
GATI SHAKTI VISHWAVIDYALAYA
(A Central University under the Ministry of Railways, Government of India)
लालबाग, वडोदरा, गुजरात / Lalbaug, Vadodara, Gujarat 390004

Written Exam Details
for The Post of Assistant Programmer
(Adv. No. GSV/REG/ADM/ Direct Rectt/2024 dated on 17/01/25)

Exam duration   : 1 hour (60 minutes)
No of questions   : 60 (Each Question carries 2 Marks)
Maximum marks   : 120
Negative marking : 1 mark for each wrong answer
Test type   : Computer based test (CBT)
Type of Questions : Multiple Choice Question (MCQ)
Tentative Date   : 12th Oct. 2025 (Sunday) (Exact date will be announced soon)

SYLLABUS

1. Object-Oriented Programming (OOP):
- Fundamental Principles: Encapsulation, Abstraction, Inheritance, and Polymorphism.
- Design Principles and Patterns: SOLID principles (Single Responsibility, Open/Closed, Liskov Substitution, Interface Segregation, Dependency Inversion). Creational, Structural, and Behavioral design patterns.

2. Data Structures & Algorithms
- Data Structures: Common data structures: Arrays, Linked Lists, Stacks, Queues, Trees, Graphs, Hash Tables.
- Algorithms: Sorting and searching algorithms, Time and space complexity analysis (Big O notation).

3. C/C++
- Pointers, memory management (malloc, free, new, delete), and smart pointers (unique_ptr, shared_ptr).
  The C++ Standard Template Library (STL): containers, iterators, and algorithms.
- Object-Oriented Programming in C++: classes, inheritance, polymorphism, virtual functions. Exception Handling in C/C++
- Modern C++ features (C++11, C++14, C++17): lambdas, move semantics, concurrency support. Multithreading and synchronization primitives. Compiler and build process (Makefiles, CMake).

4. Databases
- **Relational Databases (SQL):** Advanced SQL queries (joins, subqueries, window functions), Database design, normalization, and ER diagrams. Transactions, ACID properties, and isolation levels. Indexing, query optimization, and performance tuning.
- **NoSQL Databases:** Understanding of different types of NoSQL databases (Key-Value, Document, Column-family, Graph). Basic concepts of a popular NoSQL database (e.g., MongoDB, Redis, Cassandra).

5. JAVA
- Java: Core Concepts: Java Collections Framework, Generics and Exception Handling, Object-Oriented Programming in Java, I/O streams and File handling,
- Advanced Topics: Java Virtual Machine (JVM) internals, memory management, and garbage collection, Concurrency and multithreading (Executor framework, synchronized, volatile).

6. Web Technologies (PHP & JavaScript)
- **PHP:** Modern PHP features (PHP 7+), Object-Oriented features of PHP, Modern PHP framework (e.g., Laravel, Symfony), RESTful API development, Dependency management with Composer.
- **JavaScript:** Core JavaScript concepts (closures, prototypes, event loop), ES6+ features (let/const, arrow functions, promises, async/await), Modern JavaScript framework/library (e.g., React, Angular, Vue.js), DOM manipulation and event handling, Asynchronous programming.

9/9/25

Registrar