**Functional and Non-Functional Requirements Document**

**Title:** *Functional & Non-Functional Requirements Specification for Smart 5G Network*

**A. Functional Requirements**

| **ID** | **Requirement** | **Description** | **Priority** |
| --- | --- | --- | --- |
| FR-01 | Network Slicing | Ability to create, manage, and delete isolated network slices for different user groups | High |
| FR-02 | Dynamic Spectrum Allocation | Real-time reallocation of spectrum resources based on demand | High |
| FR-03 | Self-Optimizing Network (SON) | Automatic tuning of RAN parameters based on AI/ML algorithms | High |
| FR-04 | User Authentication & Authorization | Support for 5G AKA, eSIM provisioning, and Zero Trust-based access controls | High |
| FR-05 | Lawful Interception Module | Secure and auditable interception capabilities per legal requirements | Medium |
| FR-06 | Real-time Performance Monitoring | Dashboard and alerts for KPIs including latency, throughput, packet loss | High |
| FR-07 | Fault Management & Recovery | Automated detection, isolation, and remediation of faults | High |
| FR-08 | Multi-Vendor Interoperability | Compliance with ORAN and 3GPP interfaces for vendor-agnostic operations | Medium |

**B. Non-Functional Requirements**

| **ID** | **Requirement** | **Description** | **Priority** |
| --- | --- | --- | --- |
| NFR-01 | Scalability | System must scale to support 10 million concurrent 5G users | High |
| NFR-02 | Reliability & Availability | 99.999% uptime with disaster recovery mechanisms | High |
| NFR-03 | Maintainability | Modular design with automated testing and CI/CD pipelines | Medium |
| NFR-04 | Security | Compliance with GDPR, 3GPP security standards, and local policies | High |
| NFR-05 | Performance | Average latency under 20ms for urban users | High |
| NFR-06 | Usability | Intuitive management interfaces with role-based dashboards | Medium |
| NFR-07 | Interoperability | Support for legacy 4G and emerging 5G NR standards | High |