Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	18 JUNE 2025
Team ID	LTVIP2025TMID37665
Project Name	SMART SDLC
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	**AI – based requirement analysis**	The system shall extract and classify functional and non-functional requirements from plain text or uploaded PDF documents using the AI model.
FR2	**Design Generation**	The system shall generate design documents, UML diagrams (in PlantUML format), and system summaries from natural language descriptions.
FR3	**Code Generation**	The system shall generate clean, well-commented code in Python, JavaScript, or Java based on user prompts.
FR4	**Code Explanation**	The system shall explain the purpose, logic, and key components of submitted code snippets in detail.
FR5	**Test Case Creation**	The system shall automatically generate unit test cases for user-submitted code in the specified programming language.
FR6	**Bug Detection & Fixing**	The system shall identify syntactic/logical errors in code and provide corrected versions with explanations.
FR7	**Documentation Generator**	The system shall auto-generate developer documentation (e.g., function descriptions, usage examples) from code.
FR8	**AI Chatbot Assistant**	The system shall provide conversational support for SDLC-related queries, programming help, and best practices.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The interface shall be intuitive for developers, testers, and project managers, requiring minimal training.
NFR-2	**Hardware**	The system shall require a minimum of **4GB GPU VRAM** for optimal AI model performance.
NFR-3	**Reliability**	The system shall maintain **99% uptime** and produce accurate outputs for valid inputs.
NFR-4	**Performance**	AI responses (e.g., code generation, bug fixes) shall be delivered within **5 seconds** for prompts under 512 tokens.
NFR-5	**Privacy**	All data processing shall occur locally (no cloud dependencies) to ensure user data confidentiality.
NFR-6	**Scalability**	The backend shall handle **10+ concurrent users** without performance degradation.
NFR-7	**Maintainability**	The codebase shall follow modular design (separate frontend/backend) for easy updates and debugging.