NTMC Assignment Evaluation Plan
(Total marks: 25)

Theme: Secure Authentication and Key Management using cryptography in Smart Grid

Week 1 – Paper understanding and Environment Setup (4-9-25)

- Identify the **problem statement** (why the protocol is needed).
- Overview of background **concepts**: smart grid components, security threats, authentication methods, key management basics, system model, cryptographic primitives used (e.g., ECC, AES, HMAC, SHA-256).
- **Install required packages** based on protocol
- Proof to submit: Environment installation screenshots.

Week 2 – Technical Analysis & Comparison (5 Marks) (18-9-25)

- Learn in depth of **Protocol architecture** (Protocol steps).Cryptographic tools used (hashing, signatures, ECC...)
- **Code the assigned protocol in Python/Java (depending on group's preference)**
- Simulate communication flow (Smart Meter ↔ Service Provider ↔ Trusted Authority)
- **Implement key steps**: registration, authentication, session key generation.
- Compare with 1 or 2 existing works in that paper (efficiency, strengths, weaknesses and costs).

Week 3 – Review of limitations & Gap Identification (10 Marks) (16-10-25)

- Critically evaluate the paper:
  - What attacks does it resist? (Replay, impersonation, MITM, etc.)
  - Where does it fail? (e.g., computation & communication overhead, security features).
- Identify **gaps or open issues**, discuss Critical **review (pros, cons, open issues) about gaps and limitations.**

Week 4 – New Protocol Design (10 Marks) (6-11-25)

- **New Protocol Design :** Based on Week 3 findings, design an improved protocol
  - **Provide:**
    - System model (diagram)
    - Threat model (what attacks to resist)
    - **Complete protocol** along with steps (registration, authentication, key agreement)
    - **Implementation of a basic prototype of the new protocol in any preferred language**
- **Final Report:** Submit final report of new protocol (Introduction, background, literature review, cons, and proposed protocol). And do the **Comparison of cost (communication, computational)** along with comparative security features.

Summary of Evaluation Plan: Total 25 Marks

1. **Assignment 1: No marks 04-09-25**
2. **Assignment 2: 05 marks 18-09-25**
3. **Assignment 3: 10 marks 16-10-25**
4. **Assignment 4: 10 marks 06-11-25**