TIDCO Problem Statement:

Vee Technologies, a medical technology innovator and service provider in health scector, invites **joint proposals from academic institutions and industry partners** for the co-development of an Intelligent Textile based Wearable System.

Chronic venous disorders, particularly varicose veins, affect a substantial proportion of adults between 30–60 years of age worldwide. Early stages are frequently asymptomatic, leading to delayed diagnosis and progression to complications such as edema, skin changes, venous ulcers, and chronic pain. Existing management strategies including compression therapy and surgical or minimally invasive procedures are compliance-dependent, costly, and invasive. Despite the high prevalence of varicose veins and its progressive nature, there is no integrated wearable system that:

- Objectively assesses disease severity in early and asymptomatic stages,
- Continuously monitors venous flow dynamics in real-world conditions, and
- Provides active, personalized therapeutic intervention to enhance venous return and manage symptoms non-invasively.

To address this unmet need, Vee Technologies invites research proposals for the design, development, and validation of an **Intelligent Wearable System** that integrates:

- A **Varicose Vein Assessment Module** (severity estimation and monitoring)
- **Integrated Magneto Stockings** (passive/active circulatory enhancement)
- A **Functional Electrical Stimulation (FES) Module** (active calf muscle pump activation)

The goal is to create a clinically validated, non-invasive, comfortable, and cost-effective solution for early detection and long-term management of varicose veins.

Expected Outcomes

A. Technical Deliverables

- Functional prototype (Technology Readiness Level 5–7 preferred)
- Multimodal sensing module with validated accuracy (≥85% compared to Doppler reference where applicable)
- Closed-loop control system integrating assessment and therapy
- Mobile or cloud-based monitoring interface

B. Clinical Validation

- Demonstrated improvement in venous flow parameters
- Reduction in edema and pain scores
- Evidence of enhanced patient compliance compared to conventional compression stockings

C. Safety and Compliance

- Electrical and biocompatibility safety documentation
- Risk assessment and mitigation plan
- Preliminary regulatory pathway strategy (FDA/CE or equivalent)

D. Commercialization Strategy

- Cost-of-goods estimation
- Scalable manufacturing plan
- IP and patent strategy