



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai - 400076**

**PR: 1000030394
Rfx: 6100001326**

Technical Specification

Add on component for existing equipment Sprout-H-5W Laser System with Integrated.

Purchase of demonstration kits for setting up experiments related to photonics and quantum technologies for teaching lab in Electrical Engineering department, IIT Bombay

| Item | Item description with requirements | Quantity |
|---|--|-----------------|
| Quantum Cryptography Analogy Demonstration kit | <ul style="list-style-type: none">• Learn How Information Can Be Encrypted and Sent Using the Polarization of Light• Generate an Encryption Key that Allows for Private Communication• Encrypt, Transmit, and Decrypt a Secret Message• Examine How an Eavesdropper Causes Errors in Transmission that Can Be Detected• Demonstrate the Steps of the BB84 Encryption Protocol• Quantum Cryptography Analogy Demonstration Kit should contain the components to model a data transmission setup using the BB84 encryption protocol. This encryption method allows a sender and receiver to generate an encryption key that only they know and eavesdroppers to be detected. In this analogy experiment, the polarization of transmitted light carries bits of information which are manipulated using half- wave plates and polarizing beam splitters. | 2 |
| Quantum Eraser Analogy Demonstration Kit | <ul style="list-style-type: none">• Photons create an Interference Pattern in a Mach-Zehnder Interferometer• Demonstrates Complementarity of Particle/Wave Duality of Light• Polarization "Marks" and "Erases" Each Photon's Path Information• Quantum Eraser Analogy kit should be able to show through analogy the quantum-mechanical principle of complementarity and the erasure of path information, designed to show the fundamental principles of quantum physics, this experiment clearly displays how nature is often counterintuitive on the quantum scale. | 2 |

| | | |
|--|---|----------|
| <p>Demonstration kit of quantum control in a fluidic environment for bio-sensing and understanding Brownian noise</p> | <ul style="list-style-type: none"> • Experience the Fundamental Working Principles of an Optical Tweezers Setup • Examine Brownian Motion and Trapping of Microbeads with a Visible Laser • Demonstrate 3D Trapping of Microbeads with a Water and Cream Solution • Optical tweezers, also known as optical traps, move and manipulate small particles using only a beam of light. A focused laser beam is used to exert forces on electrically uncharged particles with sizes from 1 to 10 μm, allowing the particles to be trapped, moved, and manipulated. This optical tweezer lab kit should be optimized for classroom and lab usage. | <p>1</p> |
| | <p>The basic demonstration kit will be modified for quantum sensing experiments.</p> | |

Additional Terms and Conditions:

1) The bidder should provide:

- a) Complete technical details of the **demonstration kits**, necessary sub-parts and accessories
- b) Make, model and specifications of the **demonstration kits** and sub-parts as mentioned in schedule of requirements.
- c) Soft copy of the technical brochures and website reference of the same must be included in the bid.
- d) A local service/ maintenance centre should be available in India. A declaration from the manufacturer stating that the service support will be available at least for 3 years from the date of installation.
- e) A copy of the Authorization Certificate issued by the Original Equipment Manufacturer (OEM). The certificate must be up-to-date. A letter in the official letterhead of the OEM declaring the Indian supplier as their authorized agency to bid mentioning the official tender enquiry number must be included with the technical bid.

2) Each bidder has to mandatorily quote for all the demonstrations kits including the sub-parts as mentioned in the tender document. Partial submission of bid is not permitted.

3) The bidder should state categorically whether they have fully trained technical staff with certification from OEM for installation/ training of the tendered items. Satisfactory installation/ commissioning and handover of the items should be completed within a week from the date of receipt of the material at the Institute premises or within the time as may be extended by the Institute.

- 4) The successful lowest bidder should demonstrate **the operations of each demonstration kit** to the Purchase Committee and/ or the technical team of the institute/ department as per the technical specification during/before installation.
- 5) After-sales service support for repair/ replacement of non-functional parts should be provided by the bidder (including all services under warranty).
- 6) Manufacturer should mention the centre in India to provide the service during warranty period and after-sales. The manufacturer should provide the certificate for the genuineness of the warranty and service centre.
- 7) **Warranty – One year** from the date of the satisfactory installation and commissioning of the **demonstration kits** and the bidder should give the warranty declaration.
- 8) Setup charges for all the demonstration kits including installation and training (if any) should be included by the bidder.