Global tender for the supply of

Maskless laser lithography system based on Two-Photon Polymerization technologies with 3D automated alignment capabilities for printing onto optical fibers and photonics chips

to Indian Institute of Science Bangalore.

Contents

This is a global tender for the supply of Maskless laser lithography system based on Two-Photon Polymerization technologies with 3D automated alignment capabilities for printing onto optical fibers and photonics chips.

Section 1 - Bid Schedule

1	Tender No	CeNSE-SKS/2026-27/NQM-CF/01
2	Tender Date	09th April 2026
3	Item Description	Maskless laser lithography system based on Two-Photon Polymerization technologies with 3D automated alignment capabilities for printing onto optical fibers and photonics chips
4	Tender Type	Two bid system (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
5	Place of tender submission	Chairperson Office, First Floor, Centre for Nano Science and Engineering Indian Institute of Science, Bangalore 560012
6	Last Date & Time for submission of tender	30th April 2026, 5 PM IST
7	For further clarification	Prof. Shankar Kumar Selvaraja CeNSE, Indian Institute of Science Bangalore – 560012, India. shankarks@iisc.ac.in

Section 2 – Eligibility Criteria

Prequalification criteria:

1. The Bidder's firm should have existed for at least 5 years. Bidders should enclose the Company Registration Certificate.

2. Only the Original Equipment Manufacturer or their authorized representatives across the globe shall participate in the bid.

3. The quotations should be CIP-Bangalore Airport.

4. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 4.

5. The Bidder must not be blacklisted/banned/suspended or have a record of any service- related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.

6. The order will be placed only on the bidder who participated in the bid.

Section 3 – Terms and Conditions

A) Submission of Tender:

1. All documentation in the tender should be in English.

2. Tenders should be submitted in two envelopes (a two-bid system).
   a. Technical Bid (Part-A) – Technical bid consisting of all technical details and checklist for conformance to technical specifications.

      The technical proposal should contain a technical compliance table with five columns.
      I. The first column must list the technical requirements in the order given in the technical requirement below.
      II. The second column should provide instrument specifications against the requirement. Please provide quantitative responses wherever possible.
      III. The third column should describe your compliance with a "Yes" or "No" only. Ensure that the entries in column 2 and column 3 are consistent.
      IV. The fourth column should state the reasons/explanations/context for deviations, if any.
      V. The fifth column can contain additional remarks from the OEM. You can use this opportunity to highlight technical features, qualify responses of previous columns, provide additional details, compare your solution with your competitors, or provide details as requested in the technical requirements table below.

   b. Commercial Bid (Part-B) – Indicating item-wise price for the items mentioned in the technical bid, as per the format of quotation provided in the tender and other commercial terms and conditions.

3. The technical bid and price bid should be placed in **separate sealed covers**, superscribing the tender description, tender no., and the due date on both envelopes. Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly superscripted with the Tender No, Tender Description & Due Date.

4. The SEALED COVER should reach the **Chairperson Office, First Floor, Centre for Nano Science and Engineering Indian Institute of Science, Bangalore 560012**, on or before the due date mentioned in the tender notice. If the due date is a holiday, the tender will be accepted on the next working day. If the quotation cover is not sealed, it will be rejected.

5. All queries are to be addressed to the person identified in "Section 1 – Bid Schedule" of the tender notice.

6. GST/other taxes, levies, etc., should be indicated separately. The BIDDER should mention GST Registration and PAN in the tender document, if applicable.

7. If the price is not quoted in the Commercial Bid as per the format provided in the tender document, the bid is liable to be rejected.

8. The purchase committee reserves the right to accept or reject any bid and annul the bidding process and reject all bids at any time prior to the award of the contract without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders.

9. Incomplete bids will be summarily rejected.

B) Cancellation of Tender:

Notwithstanding anything specified in this tender document, the IISc purchase committee, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:

a. To accept OR reject the lowest tender, any other tender, or all the tenders.
b. To accept any tender in whole or in part.
c. To reject the tender, offer not confirming the tender terms.

C) Validity of the Offer:

The offer shall be valid 90 Days from the commercial bid's opening date.

D) Evaluation of Offer:

1. The technical bid (Part A) will be opened first and evaluated.

2. Bidders meeting the required eligibility criteria in Section 2 of this document shall only be considered for Commercial Bid (Part B) opening. Further, agencies not furnishing the documentary evidence as required will not be considered.

3. Prequalification of the bidders shall not imply final acceptance of the Commercial Bid. The agency may be rejected at any point during technical evaluation or commercial evaluation. The decision regarding acceptance and/or rejection of any offer in part or full shall be the sole discretion of IISc Bangalore, and the decision in this regard shall be binding on the bidders.

4. The contract award will be subject to acceptance of the terms and conditions stated in this tender.

5. Any offer which deviates from the vital conditions (as illustrated below) of the tender is liable to be rejected:

    a. Non-submission of complete offers.
    b. Receipt of bids after the due date and time or by email/fax (unless specified otherwise).
    c. Receipt of bids in open conditions.

6. In case any BIDDER is silent on any clauses mentioned in these tender documents, IISc Bangalore shall construe that the BIDDER has accepted the clauses as of the tender, and no further claim will be entertained.

7. No revision of the terms and conditions quoted in the offer will be entertained after the last date and time fixed for receipt of tenders.

8. The lowest bid will be calculated based on the total price of all items tendered for the basic equipment, accessories selected for installation, operation, preprocessing and post-processing, optional items, recommended spares, warranty, and annual maintenance contract. The purchase committee seeks the most cost-effective solution for obtaining a new tool. Vendors are encouraged to propose all avenues, including but not limited to buy back of the existing tool, turnkey upgrade of existing to, l or purchase of a new tool.

E) Pre-requisites:

The bidder will provide the pre-requisite installation requirement of the equipment along with the technical bid.

F) Warranty:

The complete system has to be under warranty for a **minimum period of 3 years** (year-wise breakup value should be shown in the commercial bid). The vendor should include the cost of any spares needed during the warranty period, including electronics,

subcomponents, and software. If the instrument is defective, it has to be replaced or rectified at the bidder's cost within 30 days from receipt of written communications from IISc, Bangalore. If there is any delay in replacement or rectification, the warranty period should be extended.

G) Annual Maintenance Contract:

An annual maintenance contract for at least three years post-warranty may be provided as an essential, optional item upon completion of the warranty period.

H) SPARES:

Vendors must provide a detailed list of spares and a user manual with a detailed Bill of Materials for all Parts. It should include the Spares Column with the Manufacturer part Number, Qty, and availability of stock after 3 Years.

I) Purchase Order:

The quantity of the items in the tender is only indicative. IISc, Bangalore reserves the right to increase /decrease the quantity of the items depending on the requirement. If the product and service quality is unsatisfactory, IISc, Bangalore reserves the right to cancel or amend the contract.

J) Delivery, Installation, and Training:

The bidder shall provide the lead time to delivery, installation, and made functional at IISc, Bangalore, from the date of receipt of the purchase order. The system should be delivered, installed, and functional within 120 days of receipt of the purchase order. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and the inspection of all the items and features/capabilities tested by the IISc, Bangalore. **For acceptance, the vendor must demonstrate all the technical specifications mentioned in the tender**. After successful installation and inspection, the date of taking over the entire system by the IISc, Bangalore, shall be taken as the start of the warranty period. **No partial shipment is allowed.**

K) Payment Terms:

Full payment (except AMC) will be released after completion of delivery, satisfactory installation, and qualification, subject to TDS as per rules. Advance payment is acceptable based on mutually agreeable terms. As per GFR, no advance payment can be made to domestic vendors unless an equal amount of bank guarantee is provided.

L) Statutory Variation:

Any statutory increase in the taxes and duties subsequent to the bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc, Bangalore, subject to the claim supported by documentary evidence. However, if any decrease occurs, the advantage will have to be passed on to IISc, Bangalore.

M) Disputes and Jurisdiction:

Any legal disputes arising from any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction in Bangalore, India.

N) General:

1. All amendments, time extensions, clarifications, etc., within the tender's submission period, will be communicated electronically. No extension of the bid due date/time shall be considered due to a delay in receipt of any document(s) by mail.

2. The bidder may furnish any additional information necessary to establish capabilities to complete the envisaged work successfully. It is, however, advised not to furnish superfluous information.

3. With prior intimation, the bidder may visit the installation site before tender submission.

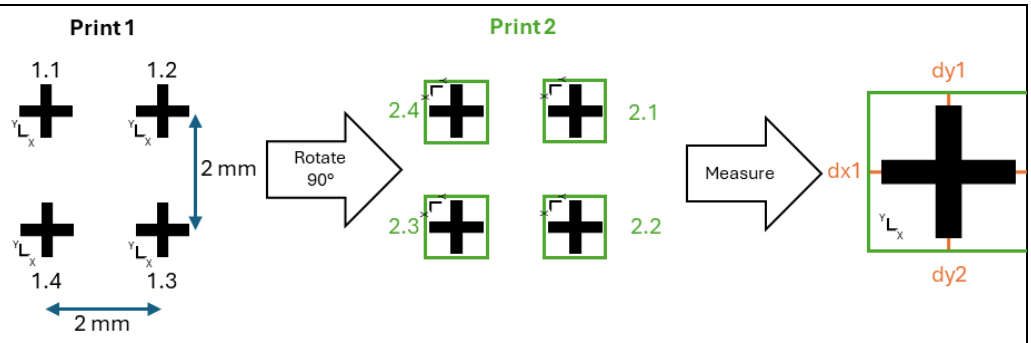
4. Any information furnished by the bidder found to be incorrect, immediately or later, would render the bidder liable to be debarred from tendering/taking up work in IISc, Bangalore.

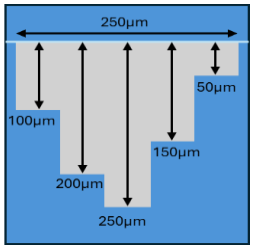
Section 4 – Technical Specifications

The specifications have to be demonstrated during system installation and acceptance.
"Maskless laser lithography system based on Two-Photon Polymerization technologies with 3D automated alignment capabilities for printing onto optical fibers and photonics chips" – Quantity: 1

Specification	Detailed description
Technologies: 3D microfabrication system based on techniques Two-Photon Polymerization (2PP) and Voxel size tuning (Two-Photon Grayscale Lithography) along with automated 3d alignment configuration	**System including technologies:** i. Two-Photon Polymerisation for precise 3D printing of micro-optical elements ii. Two-Photon Grayscale Lithography (for voxel size modulation) for 3D printing of structures with feature size control (typically down to 100nm) and smooth surfaces at the highest printing speeds. iii. Aligned Two-Photon lithography technology for automated 3D nanometer range alignment to automatically print directly onto photonics chips. The typical automatic, lateral placement accuracy shall be below 100 nm on chips, as well as below 500 nm in XY towards the cores of optical fibers. iv. Dip-In Laser Lithography with an upright platform for writing on pre-structured surfaces using the full effective working distance of the writing objective lens.
Configuration: Hardware - integrated femtosecond-pulsed laser with hardware for pinpoint control of focus position, and laser power capable of voxel modulation rate of 1000kHz	The system shall be configured to consist of an objective lens, a laser beam scanning mechanism, and a femtosecond laser source, based on the principle of two-photon polymerisation. To minimise optical aberrations and enhance fabrication precision, the configuration shall incorporate an oil-immersion objective lens, which is directly immersed in a droplet of photoresist during the structuring process. i. Integrated femtosecond-pulsed laser with centre wavelength 780 ± 20nm, and an average power ≥ 200 mW ii. Ultra-precise beam scanner with a calibrated print field diameter of at least 700 μm for an objective lens with lower resolution and higher throughput, and at least 270 μm for an objective lens with the highest resolution. iii. Substrate positioning within an addressable area of at least 150 x 150 x 10 mm^3 (X, Y, Z), for exact positioning and precise integration of adjacent printing fields iv. Process camera for a live view of the printing process and two navigation cameras for precise substrate positioning. All cameras must be accessible via an integrated screen to allow operation of the system on-site.
Printing Sets & Criteria	Application solutions sets and necessary hardware to print freeform microoptics directly onto optical fibers & photonic chips with submicron accuracy

Hardware and software to print on fibers	i. Fiber core illumination unit for at least 32 fibers. For laser safety, the illumination unit shall be inside of the print chamber. ii. Substrate holder with submounts for standard v-groove fiber arrays, as well as submounts for single cleaved fibers (SM/MM/PM). The holders must be able to accommodate up to four fiber arrays simultaneously to allow throughput printing. iii. Print parameters for optical quality surfaces at high throughput **Mandatory proof: fully lensed 8-channel fiber array for collimation** A standard fiber array shall be populated with lenses that collimate to a mode field diameter (MFD) of 25µm at a wavelength of 1550 nm. The following criteria must be met and proven upon request: a) Quality – surface roughness Ra < 10 nm b) Automatic alignment – the print job shall only include manual input for the selection of the 1st and 8th fiber. Alignment to each fiber core must be automatic c) Throughput - total time for fabrication, including automatic detection must be less than 20 minutes
Hardware and software to print high-quality microoptics on photonic chips	i. Confocal detection module (for 3D mapping of topographies) for reliable detection of fiducials on photonic chips, placement accuracy ≤ 100 nm (XY) ii. Software for in-situ alignment and 3D printing of microoptical elements iii. Substrate holder for photonic chips, unmounted with flat bottom (variable size), compatible materials: Silicon, SiP, SoI, SiN, InP, polymers, glass and substrate holder for photonic chips mounted in standard TO can housing iv. Parameters to print on the edges of chips **Mandatory proof: aligned on-chip printing** The system must be able to automatically align position and rotation on chips to markers on a substrate. To proof that the following print shall be performed and documented by video: Fabricate four crosses (size 5 µm – 50 µm), as well as one indicator of the directions of the coordinate system axes and print them onto a blank substrate with a spacing of 20 mm (markers 1.1, 1.2, 1.3 and 1.4, see figure). The substrate is now rotated by 90° (by rotating stage or by unloading, rotating and loading). Now the system moves back to marker 1.1. The marker is automatically recognized, and a square rim ("marker 2.1") printed around marker 1.1, with a target gap of 2 µm between the inner part of the rim and the tips of the cross. The goal is that the centers of marker 1.1 and marker 2.1 are exactly on top of each other. The system moves to marker 1.2, 1.3 and 1.4, and an identical square rim (marker 2.2, 2.3 and 2.4, respectively) are printed.

	 The following criteria shall be evaluated by scanning electron microscopy (SEM) and must be met: a) Alignment qualification – markers 1.1 and 2.1 must not overlap in any of the printed structures. The same holds true for all other markers (1.2 and 2.2, etc.). b) For each marker, the distance between the cross and the rim is measured at the four cross tips, resulting in the numbers dx1, dx2, dy1, dy2. The absolute deviation, defined as Dx = abs(abs(dx1) – abs(dx2))/2 and Dy = abs(abs(dy1)-abs(dy2))/2 must be calculated. All deviations for all markers have to be < 200 nm
High-resolution print head: The system should be equipped with two different print heads. One should allow highest resolution printing.	Print parameter presets for 3D printing of nano- and microscale structures using 2PP and two-photon grayscale lithography with a print head fulfilling the following requirements: • Numerical aperture: ≥ 1.4 (63x) • Calibrated print field diameter: ≥ 270µm • Working distance: ≥ 360 µm
Medium-resolution print head: The system should include one print head with medium resolution to allow higher throughput while achieving optical quality surfaces. **Microlens array printing** - system capable of printing a high-quality microlens array at high throughput	Print parameter presets for 3D printing of nano- and microscale structures using 2PP and two-photon grayscale lithography with a print head fulfilling the following requirements: Medium features print head including immersion objective lens (25x, NA 0.8) • Numerical aperture: ≥ 0.8 • Print field diameter: ≥ 700 µm • Working distance: ≥ 380 µm **Mandatory proof: microlens array printing (MLA)** The system must be capable of printing a high-quality microlens array, defined as a square grid of spherical microlenses with 100 µm period, radius of curvature 100 µm, 20 µm height, and a total area of 8 mm x 8 mm total area, with correction of the tilt between galvo and substrate plane (tilt). The following criteria must be fulfilled and demonstrated upon request: a) Shape accuracy – the height of three randomly selected lenses must be (20 ± 1) µm (substrate surface to top) b) Quality – the surface roughness must be Ra ≤ 20 nm c) Throughput – the sample must be printed in less than 24 hours If any of the above criteria are not met the entire criterion counts as not met.

Software for aligned 3D micro-printing	Software for micro 3D printing based on Two-Photon Polymerisation (2PP) with precision, throughput and full design freedom, including the following features: i. Capability of the import of 3D objects including *.stl and *.obj files ii. 3D canvas preview, including alignment procedures iii. Full control over print parameters and advanced parameter sweep functions iv. Simultaneous import of multiple 3D objects, with the option to apply different process parameters to optimise throughput v. Inclusion of alignment procedures, such as fiducial and fibre core detection, as well as autofocus and automatic tilt compensation vi. Alignment and compensation of beam clipping at the edge of non-transparent substrates **Mandatory proof: chip edge printing** The system software must be able to automatically detect the edge of a silicon substrate using an objective with NA≥0.5 in a situation where the beam is clipped when printing over the chip's edge. A comb-like structure (see figure  below) with 5 different combs of 250 µm depth must be printed. The print must meet the following criteria: a) Automation – an automatic edge printing compensation method must be used. Manual shape-dependent compensation and iteration may not be used and proven by submitting screenshots of the print job preparation b) Fabrication possibility – all comb teeth should be visible with a scanning electron microscope c) Shape accuracy – all comb teeth must have the correct height within a tolerance of ± 5 µm.
System noise level	The noise level of the system must be below 50 dB(A) according to ISO 11204 for high-precision print. (Third-party proof required)
Machine user interface	i. Machine user interface: a system with a single integrated touchscreen serves as an interface to the machine operator, allowing the control of the printer hardware as well as starting and visually observing the printing process. It must not be necessary to have a table plus an operating computer installed in the installation room itself. ii. Remote User Interface: A remote access software shall be provided to start and monitor print jobs from the office.
Materials	At least two transparent photoresins with sufficiently different refractive indices n are available for the production of chromatically corrected optics. At the same time, the resins should have different Abbe numbers v. The values given are required for polymerised photoresin. Independent proof required (peer-reviewed

	scientific publication or independent measurement e.g. by an external laboratory). - Two resins must be available with a refractive index difference $\Delta n(@\lambda=589nm)>0.1$, Abbe number difference $\Delta v>20$ in their 2PP-polymerized state - At least one resin must have an RI >1.6 at 589 nm wavelength in its 2PP-polymerized state
Industrial-grade form factor	System is of industrial-grade form factor, typical dimensions around LxWxH 160 x 100 x 175 cm with granite base and closed housing including the laser.
Full system warranty	Full system warranty which covers failure of the full system. It includes remote failure diagnostics, new or reconditioned components (as deemed necessary by manufacturer staff). All costs related to the repair including shipping, duties, travel, labor and optical alignment.
Accessories	Vendors are encouraged to add components or accessories that may improve the performance of the system.
Training	Training should be part of the installation and acceptance. Please specify if there are on-site training options at the vendor site
Technical evaluation	Samples will be provided for demonstration of the capability. The demonstration should be done through an online videoconference on the samples provided.

Vendors are encouraged to quote optional items that may improve the performance and functionality of the system.

Section 5- Technical Bid

The technical bid should furnish all requirements of the tender along with all annexures in this section and be submitted to:

The Chairperson,
First floor, Centre for Nano Science and Engineering,
Indian Institute of Science,
CV Raman Ave. Bangalore – 560012, India.

Kind Attn: Prof. Shankar Kumar Selvaraja

Annexures

Annexure 1:

Details of the Bidder

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

Details of the Bidder

Sl. No	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach an attested copy of the Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/Trade License (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact Person: Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name
Designation, Seal Date:

Annexure 2:

Declaration regarding experience

To,
The Chairperson,
Attn: Prof. Shankar Kumar Selvaraja
Centre for Nano Science and Engineering,
Indian Institute of Science,
CV Raman Ave. Bangalore – 560012, India.

Ref: Tender No: XXXXXXXXX Dated: XXXXX

Dear Sir/Madam

I have carefully reviewed the Terms & Conditions in the above-referred tender. I hereby declare that my company/firm has years of experience in supplying and installing the proposed equipment.

(Signature of the Bidder)
Printed Name
Designation,
Seal
Date:

Annexure 3:

Declaration regarding track record

To,
The Chairperson,
Attn: Prof. Shankar Kumar Selvaraja
Centre for Nano Science and Engineering,
Indian Institute of Science,
CV Raman Ave. Bangalore – 560012, India.

Ref: Tender No: XXXXXXX
Dated: XXXXX

Dear Sir/Madam,

I have carefully reviewed the Terms & Conditions in the above-referred tender. I hereby declare that my company/ firm is not currently debarred/blacklisted by any Government / Semi-Government organizations/institutions in India or abroad. I further certify that I am a competent officer in my company/firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted / case is Pending	Blacklisted/debarred by Government / Semi-Government/Organizations /Institutions	Reason	Since when and for how long

(NOTE: In case the company/firm was blacklisted previously, please provide the details regarding the period for which the company/firm was blacklisted and the reason/s for the same).

Yours faithfully (Signature of the Bidder)

Name
Designation,
Seal

Date:

Annexure 4:

Declaration for acceptance of terms and conditions

To,
The Chairperson,
Attn: Prof. Shankar Kumar Selvaraja
Centre for Nano Science and Engineering,
Indian Institute of Science,
CV Raman Ave. Bangalore – 560012, India.

Ref: Tender No: XXXXXX

Dated: XXXX

Dear Sir/Madam,

I have carefully reviewed the Terms & Conditions mentioned in the above-referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I am an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the
Bidder) Name
Designation, Seal Date:

Annexure 5:

Details of items quoted:

a. Company Name
b. Product Name
c. Part/Catalogue number
d. Product description/main features
e. Detailed technical specifications
f. Remarks

Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with the technical bid.
3. Bidders should clearly indicate compliance or non-compliance with the technical specifications provided in the tender document.

Section 6 – Commercial Bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned:

S No	Description	Cat. Number	Quantity	Unit Price	Sub total
1	Essential items noted in the technical specification				
1.a	… (details of essential items)				
1.b	…				
2	Optional items noted in the technical specification				
2.a	… (details of essential items)				
2.b	…				
3.	Accessories for operation and installation				
4.	All Consumables, spares and software to be supplied locally				
5.	Warranty				
6.	AMC 2 years beyond warranty				
7.	Cost of Insurance and Airfreight				
8.	CIP/CIF IISc, Bengaluru				

Any additional items

S No	Description	Cat. Number	Quantity	Unit Price	Sub total

Addressed to:

The Chairperson,
Attn: Prof. Shankar Kumar Selvaraja
Centre for Nano Science and Engineering,
Indian Institute of Science,
CV Raman Ave. Bangalore – 560012, India.

Section 7 – Checklist

(This should be enclosed with a technical bid- Part A)
The following items must be checked before the Bid is submitted:

1. Sealed Envelope "A": Technical Bid

1. **Section 5- Technical Bid (each page signed by the authorized signatory and sealed) with the below annexures:**
    a. **Annexure 1: Bidders details**
    b. **Annexure 2: Declaration regarding experience**
    c. **Annexure 3: Declaration regarding clean track record**
    d. **Annexure 4: Declaration for acceptance of terms and conditions**
    e. **Annexure 5: Details of items quoted**
    f. **Annexure 6: Authorisation letter from the OEM in case of the local representative.**
2. **Copy of this tender document duly signed by the authorized signatory on every page and sealed.**

2. Sealed Envelope "B": Commercial Bid

Section 6: Commercial Bid

Your quotation must be submitted in two envelopes: **Technical Bid (Envelope A) and Commercial Bid (Envelope B),** superscribing on both the envelopes with, Tender description, Tender No. and due date and both of these in sealed covers and put in a bigger cover which should also be sealed and duly super scribed with Tender No., Tender description & Due Date.