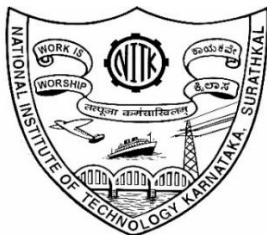


NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

CENTRAL RESEARCH FACILITY
POST SRINIVASNAGAR, MANGALURU – 575 025 (D K)

Phone: (0824) 2474000.
E- mail: office.crf@nitk.edu.in

Fax: (0824) 2474033
Website: <http://www.nitk.ac.in>

**TENDER DOCUMENT**

Tender Notification No: NITK/CRF/ME/SCORE/DOC04

Date: 13/09/2019

Name of Goods : **Single Cylinder Optical Research Engine (SCORE)**

Estimated amount put to Tender : Rs. 1,35,00,000/- (Rs. 135Lakhs)

EMD Amount (2% of estimated amount) : Rs. 2,70,000/- (Rs. Two lakh seventy thousand)

Time for Supply of item : 4 Months

Date, Time& Venue of Pre-Bid Conference : **11/10/2019 at 3.30 pm**
Board Room, Main Building, NITK Surathkal
(Refer Section 1 B, Clause No. 34)

Start date for submission of e-tender : 15/10/2019

Last date for Request tender document : **12/11/2019 before 3.00 p. m.**

End date for submission of e-tender : **12/11/2019 before 4.00 p.m.**

Address for Submission of Tender : <https://mhrd.euniwizarde.com>

Opening date of technical bid : 14/11/2019 at 3.45 p.m.
Board Room, Main Building, NITK Surathkal

Contact Details of Buyer : Dr. Kumar G. N.
Contact No.:+91-9481848572
E-mail: gnkumar33@gmail.com

Purchase officer Name and Contact : Pritam Bansod Ramesh, Assistant Registrar (Purchase)
(Related to purchase inquiry) Phone: +91-824-2473993 Email: pritamansod@nitk.ac.in



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Date: 13/09/2019

NOTICE INVITING e-TENDER (e-NIT)

The National Institute of Technology Karnataka, Surathkal (in short – NITK, Surathkal) is an autonomous institute under Ministry of HRD Govt of India imparting Technical Education and engaged in Research Activities. It is proposed to procure equipment for Central Research Facility.

Online Tenders(<https://mhrd.euniwizarde.com/>) are invited for the following items in **two cover system** (i.e., Technical bid and financial bid) subject to the following terms and conditions, from the reputed manufacturers or it's authorized dealers so as to reach this office on or before scheduled date and time. The tender (Technical bid) will be opened online on the due date as mentioned. Bidders can verify their bid status through online portal <https://mhrd.euniwizarde.com/>. The financial bid of only such bidders whose technical bid is accepted shall be opened on the same day or later pre-informed date.

1. **Name of Goods** : **Single Cylinder Optical Research Engine (SCORE)**
 2. **Estimated Cost** : Rs. 1,35,00,000/- (Rs. 135Lakhs)
 3. **E M D (2% of estimated amount)** : Rs. 2,70,000/- (Rs. Two lakh seventy thousand)
 4. **Time for completion of Supply after Placing Purchase Order** : 4 Months
 5. **Date, Time & Venue of Pre-Bid Conference** : 11/10/2019 at 3.30 pm
Board Room, Main Building, NITK Surathkal
(Refer Section 1 B, Clause No. 34)
 6. **Start date for submission of e-tender** : 15/10/2019
 7. **Last date for Request tender document** : 12/11/2019 before 3.00 p.m.
 8. **End date for submission of e-tender** : 12/11/2019 before 4.00 p.m.
 9. **Address for Submission of Tender** : <https://mhrd.euniwizarde.com>
 10. **Date of opening of technical bid** : 14/11/2019 at 3.45 p.m.
Board Room, Main Building, NITK Surathkal
- Contact Details of Buyer** : Dr. Kumar G. N.
Contact No.:+91-9481848572
E-mail: gnkumar33@gmail.com

Note: Institute shall not be responsible for any postal delay about non-receipt / non-delivery of the bids related documents or due to the wrong addressee.

Sd/-
Chairman, CRF

SECTION 1 A:- PROCEDURE FOR SUBMISSION OF E-TENDER

The bidders are required to submit soft copies of their bid electronically on the e-Wizard Portal using valid Digital Signature Certificates. Below mentioned instructions are meant to guide the bidders for registration on the e-Wizard Portal, prepare their bids in accordance with the requirements and submit their bids online on the e-Wizard Portal. For more information bidders may visit the e-Wizard Portal <https://mhrd.euniwizarde.com>

1. REGISTRATION PROCESS ON ONLINE PORTAL

1. Bidders to enrol on the e-Procurement module of the portal <https://mhrd.euniwizarde.com> by clicking on the link "Bidder Enrolment" as per portal norms.
2. The bidders to choose a unique username and assign a password for their accounts. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the e-Wizard Portal.
3. Bidders to register upon enrolment their valid Digital Signature Certificate (DSC: Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India with their profile.
4. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse. Foreign bidders are advised to refer "DSC details for Foreign Bidders" for Digital Signature requirements on the portal.
5. Bidder then logs in to the site through the secured log-in by entering their user ID/password and the password of the DSC / e-Token.

2. TENDER DOCUMENTS SEARCH

1. Various built-in options are available in the e-Wizard Portal which is further synchronizing with CPP Portal to facilitate bidders to search active tenders by several parameters. These parameters include Tender ID, organization, location, date, value, etc.
2. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, a form of contract, location, date, other keywords, etc. to search for a tender published on the Online Portal.
3. Once the bidders have selected the tenders they are interested in, they may download the required documents/tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the Online Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.

4. The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification/help from the Helpdesk.

3. BID PREPARATION

1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid.
3. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that needs to be submitted. Any deviations from these may lead to rejection of the bid.
4. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/schedule and generally, they can be in PDF / XLS / PNG, etc. formats. Bid documents may be scanned with 100 dpi with black and white option.

4. BID SUBMISSION

1. Bidder to log into the site well in advance for bid submission so that he/she uploads the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2. The bidder to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3. Bidder to select the payment option as "Online" to pay the tender fee/ EMD wherever applicable and enter details of the instrument.
4. A standard BoQ format has been provided with the tender document to be filled by all the bidders. Bidders to note that they should necessarily submit their financial bids in the prescribed format and no other format is acceptable.
5. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, the opening of bids, etc. The bidders should follow this time during bid submission.
6. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data, which cannot be viewed by unauthorized persons until the time of bid opening.
7. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

8. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
9. Kindly have all relevant documents in a single PDF file of compliance sheet.
10. **The off-line tender shall not be accepted and no request in this regard will be entertained whatsoever.**

5. AMENDMENT OF BID DOCUMENT

At any time prior to the deadline for submission of proposals, the institutions reserve the right to add/modify/delete any portion of this document by the issuance of a Corrigendum, which would be published on the website and will also be made available to the all the Bidder who has been issued the tender document. The Corrigendum shall be binding on all bidders and will form part of the bid documents.

6. ASSISTANCE TO BIDDERS

1. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
2. Any queries relating to the process of online bid submission or queries relating to e-Wizard Portal, in general, may be directed to the 24x7 e-Wizard Helpdesk. The contact number for the helpdesk is **011-49606060, 23710092, 23710091, Sanjeet Kumar Jha +91-8882495599, 9350530626, Gagan +91 8448288987, Vijay +91 9113518121, 8448288989**

7. INSTRUCTIONS TO THE BIDDERS

1. **Process for Bid submission through MHRD portal is explained in Bidder Manual. Bidders are requested to download Bidder Manual from the home page of MHRD website (<https://mhrd.euniwizarde.com>). Steps are as follows (Home page ⇒ Downloads ⇒ Bidder Manuals).**
2. The tenders will be received online through portal <https://mhrd.euniwizarde.com>. In the Technical Bids, the bidders are required to upload all the documents in .pdf format.
3. Possession of Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/ e-Token in the company's name is a prerequisite for registration and participating in the bid submission activities through <https://mhrd.euniwizarde.com>. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site <https://mhrd.euniwizarde.com> under the link 'DSC help'. Tenderers are advised to follow the instructions provided in the 'Instructions to the Tenderers for the e-Submission of the bids online through the e-Wizard Portal for e-Procurement at <https://mhrd.euniwizarde.com>.

4. **Meaning of “Date for Request tender document”**

The bidder has to “Request the tender” to MHRD portal before the “Date for Request tender document”, to participate in bid submission.

8. All entries in the tender should be entered in online Technical & Commercial Formats without any ambiguity.
9. Any order resulting from this e-tender shall be governed by the terms and conditions mentioned therein.
10. No deviation to the technical and commercial terms & conditions are allowed.
11. The tender inviting authority has the right to cancel this e-tender or extend the due date of receipt of the bid(s).

SECTION 1 B: INSTRUCTION TO BIDDER (ITB)

1. The bid should be submitted in two covers System-Technical Bid and Financial Bid through <https://mhrd.euniwizarde.com>
2. **Technical Bid: Documents related to the Technical Bid** should be submitted in PDF format through eTendering portal <https://mhrd.euniwizarde.com>.
3. **The Technical Bid should contain the following documents:**
 - a) Compliance statement of specifications as per **Annexure - 'A'**.
 - b) License certificate for manufacture /supply of the item & Factory license
 - c) Agreements/Purchase Orders/Completion certificates if any, for similar items to other Universities, Institutes, and Government Department/Undertakings/Public sectors the details of such supplies for the preceding three years should be given together with the prices eventually or finally paid with contact details of persons as per **Annexure – 'B'**.
 - d) List of Owner/partners of the firm and their contact numbers (Bidder Information)
 - e) Declaration of abandoned or suspended any awarded service & Blacklist Certificate. **Annexure 'C'**
 - f) Integrity Pact (for procurements above Rs1.0 Crore (Rs10.0 Million). **Annexure 'D'**
 - g) Copy of GST certificate & PAN No.
 - h) Catalog of the Product with detailed product specifications.
 - i) Undertaking that the successful BIDDER agrees to give a Performance Security amounting to 10%of the purchase order value in favor of "The Director, NITK Surathkal".
 - j) The copy of the Balance sheet, Profit & Loss A/c., Trade or Manufacturing A/c for the last 3 years should be enclosed and the turnover must be 30% of the estimated cost.
 - k) Duly filled in the checklist should be submitted along with the Technical Bid.
 - l) Contract form given in Section 5 needs to be submitted.
 - m) **EMD must be** in the form of Bank Guarantee (**ANNEXURE –G**)/Fixed Deposit Receipt/DD/e-Payment mode (through Credit/Debit cards, Net Banking). It will be valid for **180 days** from the date of opening of the tender. In case of EMD payment made through E-Payment, UTR Number with details should be uploaded. The firm registered with MSME/NSIC as per MSME procurement policy order 2012 will be exempted from submission of EMD. Intended parties will have to give proof of registration along with their tender. EMD of the unsuccessful bidders shall be refunded without any interest at the earliest after finalization of the purchase of the concerned item.
 - i) The EMD will be returned to the BIDDERS(s) whose offer is not accepted by NITK within one

month from the date of the placing of the purchase order(s) on the selected BIDDER(s). In the case of the BIDDER(s) whose offer is accepted the EMD will be returned on submission of Performance Security in the form of Bank Guarantee (BG). However, if the return of EMD is delayed for any reason, no interest/penalty shall be payable to the Bidders.

- ii) The successful BIDDER, on the award of contract/order, must send the contract/order acceptance in writing, within 15 days of award of contract/order failing which the EMD will be forfeited.
- iii) The EMD shall be forfeited in case a successful BIDDER fails to furnish the Performance Security.
- iv) Bidder should prepare the EMD as per the instructions specified in the tender document. The original EMD should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission as specified in the tender documents. The details of the BG/DD/FD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise, the uploaded bid will be rejected.

4. Financial bid : The bidders should submit their financial bid as per the format given in Section 4 (A standard BoQ format has been provided with the tender document in the form of an Excel sheet) of the Notice Inviting Tender in the online bid through e-Tendering portal <https://mhrd.euniwizarde.com>. After evaluation of technical bid, the technically successful bidder shall be intimated to witness the opening of their financial bid along with date, time and venue through e-mail. The financial bid of only those bidders' will be opened who are declared "Technically Successful or Technically Responsive".

5. Bid Evaluation:

On the due date, the Technical bids will be opened and referred to the Purchase Committee which is duly constituted by the Director, NITK. The committee will go through the technical aspects of the tender and recommend shortlisted firms. The recommendation of the committee is final and binding on all the parties. The committee may visit the manufacturing site to assess the capabilities to manufacture the tendered items as per the specifications. In case of any remarks/default noted, the EMD will be forfeited even if pre-qualified.

6. Quoting of Price(s):

- a. Indian bidder should quote firm prices in Indian rupee only unless otherwise specified elsewhere in this tender. Prices quoted in any other currency shall not be considered.
- b. In case of Global Tender, Price quoted should be in Indian Rupees/US Dollar/Euro/Pound Sterling/Yen or in a currency under Reserve Bank of India's notified basket of currencies and must include delivery at NITK, Surathkal including loading/unloading.

- c. For the purpose of price evaluation, if the bid is submitted in Foreign Currency, then the bid price shall be converted to Indian Rupees as per the RBI Exchange Rate prevailing on the day of the opening of the price bid.
7. The Bid will be accepted only from the manufacturers (OEM) or its authorized supplier.
8. The incomplete or conditional tender will be rejected.
9. The Institute reserves the right to cancel at any time after acceptance of the tender with a notice. The Supplier shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which might have derived from the execution of the supply.
- 10. Performance Security** The successful bidder shall deposit performance security of 10% of the quoted price in the form of Bank Guarantee (**ANNEXURE -G**) / Demand Draft / Fixed Deposit Receipt of any scheduled bank drawn in favour of **The Director, NITK Surathkal, Mangaluru** payable at Mangaluru. In case the bidder fails to deposit the said Performance Security within the stipulated period, including the extended period if any, the Earnest Money Deposited by the bidder shall be forfeited automatically without any notice. Please note the following points:
- a) Successful bidder should submit performance Security as prescribed above to the purchase Section, NITK Surathkal, on or before 30 days from the date of issue of order acknowledgment.
 - b) Performance Security shall be for the due and faithful performance of the contract and shall remain binding, notwithstanding such variations, alterations for extensions of time as may be made, given, conceded or agreed to between the successful bidder and the purchaser under the terms and conditions of acceptance to tender.
 - c) The successful bidder is entirely responsible for the due performance of the contract in all respects according to the terms and conditions of the tender.
 - d) The validity of the Performance Security must cover the warranty period plus two months.
 - e) In case of imported goods, the Indian agent has to furnish Performance Bank Guarantee in Indian Rupees only from Scheduled Bank.
- 11. The validity of bids:** The rate quoted should be valid for a minimum of 180 days. No claim for escalation of the rate will be considered after opening the Tender.
- 12. Warranty/Guarantee & On-site skill support:** On-site comprehensive warranty will be effective from the date of successful installation and commissioning. The OEMs/Authorized Distributors and Dealers must attach a certificate of sales and service facilities, escalation support for on-call service or station engineer, etc.
- 13. Imports:** In case, equipment is to be imported, the Indian agent should furnish authorization certificate by the principles abroad for submission of the bid in response to this Notice Inviting Tender.

- 14. Clarification of Tender Document:** Through pre-bid Conference (Under Section 1, clause No. 34).
- 15. Amendment of Tender document:** At any time prior to the last date for receipt of bids, Institute may for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the Tender document by an amendment. Further, Institute may at its own discretion extend the last date for the receipt of bids.
- 16.** The bids shall be written in English language and any information printed in another language shall be accompanied by an English translation, in which case for the purpose of interpretation of the bid, the English translation shall govern.
- 17.** The Institute reserves the right of accepting any bid other than the lowest or even rejecting all the bids. The decision of the Purchase Committee is final in all matters of tender and purchase.
- 18. Cancellation of Tender:** Notwithstanding anything specified in this tender document, NITK Surathkal in its sole discretion, unconditionally and without having to assign any reasons, reserves the rights:
- a) To accept OR reject lowest tender or any other tender or all the tenders.
 - b) To accept any tender in full or in part.
 - c) To reject the tender offer not conforming to the terms of the tender.
 - d) To give purchase preference to Public Sector undertakings when applicable as per Govt. Policy/ Guidelines.
- 19. Delivery Period:** The Delivery Period/Time shall be deemed to be the essence of the Contract and delivery must be completed not later than such date(s). If the Supplier does not perform its obligations within the Delivery Period/Date mentioned in the Contract, the same would constitute the breach of the Contract and the Institute shall have the right to cancel or withdraw the Contract for the unsupplied portion after the expiry of the original or extended delivery date or period stipulated in the Contract. Such cancellation of the contract on account of non-performance by the Supplier would entitle the Buyer to forfeit the EMD / Performance Security besides other actions such as debarment from the Institute as per GFR 2017.
- 20. Liquidated Damages:** Timely delivery is the essence of contract and hence if the Supplier fails to deliver Goods within the original/extended delivery period(s) specified in the contract, the Institute will be entitled to deduct/recover the Liquidated Damages for the delay, unless covered under Force Majeure conditions aforesaid, **@ 1% per week or part of the week of delayed period** as pre-estimated damages not exceeding 5% of the contract value without any controversy/dispute of any sort whatsoever.
- 21. Terms of Payment:**
- a. Payment within 30 days from the date of delivery and Acceptance Certificate of concerned Department/Section/Purchase Section.

- b. Payment shall be made by Cheque or such other mode/electronic fund transfer offered by the Bank. NITK, Surathkal will not pay advance payment to the party. Any request for Advance payment will be rejected summarily. In case if it is necessary, the advance payment will be paid strictly against Bank Guarantee only.
 - c. Payment will be made by Standard Payment terms and conditions of NITK, Surathkal as per tender document only. Any request for a change in payment terms and conditions will not be accepted.
 - d. If the above conditions are not acceptable then tender will be rejected.
22. Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bid as to the nature of the installation site, the means of access to the site and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the installation to be done and local conditions and other factors having a bearing on the execution of the bid.
23. If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the bidder.
24. The rate quoted by the bidder **shall be firm throughout the contract** period and there shall be no revision of the rates for any reasons whatsoever. It should be clearly understood that any claim for changes will not be entertained in any case once the bids are opened.
25. **One bid per bidder:** Each bidder shall submit only one bid either by himself or by representing a firm.
26. **Cost of bid:** The bidder shall bear all costs associated with the preparation and submission of his bid. The Institute in no case shall be responsible or liable for those costs.
27. The bidder shall not make or cause for any alteration, erasure or obliteration to the text of the tender document.
28. The Institute will declare a bidder ineligible, either indefinitely or for a specified period of time, at the sole discretion of the Institute, for the award of contract/ participating in any other tender, if at any time the Institute determines that he has furnished false information/ engaged in corrupt or fraudulent practices.
29. If any overpayment is detected as a result of the post-payment audit, it shall be recovered by the Institute from the Supplier out of his Performance Security.
30. **Determination of successful bidder:** The technically qualified bidder whose offer is evaluated as the **lowest total bid** shall be the successful bidder subject to its meeting the statutory requirements.
31. **Price variation:** The rate quoted by the bidder shall be firm throughout the contract period. No price variation clause is applicable to this contract.

32. CANVASSING:

- a) Canvassing in connection with tenders is strictly prohibited and the Tenders submitted by the Tenderers who resort to canvassing shall be liable to rejection.
- b) Subject to the provisions concerning clarification of Bids, no Bidder shall contact the purchase committee on any matter relating to its bid from the time of the bid opening up to the time that the contract is awarded.
- c) Any effort by the Bidder or Bidder's representative however described to influence the purchase committee in any way concerning scrutiny, consideration, evaluation of the Bid(s) or decision concerning award of contract shall entail rejection of Bid and action against the bidder as deemed fit.
- d) The purchase committee will deal with the Bidder on a Principal basis, without involvement in any manner in India or abroad of any agent or consultant or associate or another person howsoever described.

33. Legal Matter: All Domestic and International disputes are subject to Mangaluru Jurisdiction only.

34. Pre-Bid Conference:

- a) All prospective bidders are requested to kindly submit their queries through E-mail to gnkumar33@gmail.com & cc to office.crf@nitk.edu.in so as to reach the buyer, **on or before 30-09-2019 before 4.00pm.**
- b) A Pre-bid Conference shall be held as indicated in Invitation to Bid. All prospective bidders are requested to kindly attend the Pre-bid Conference. In order to facilitate NITK for the proper conduct of the Pre-bid Conference, all prospective bidders are requested to kindly submit their queries through E-mail to the indicated mail address (with Tender No. and Date) so as to reach the Buyer as indicated in Invitation to Bid.
- c) NITK shall answer the queries during the pre-bid conference, which would become a part of the proceedings of the Pre-bid Conference. These proceedings will, in turn, become a part of clarifications/amendments to the bidding documents and would become binding on all the prospective bidders. These proceedings would also be hosted on NITK website www.nitk.ac.in for the benefit of all prospective bidders. Before formulating and submitting their bids, all prospective bidders are advised to surf through the NITK website after the Pre-bid Conference, in order to enable them to take cognizance of the changes made in the bidding document.
- d) Any Statement made at the pre-bid conference shall not modify the terms of the bidding documents unless such statement is made part of clarification in the proceeding of Pre-Bid Conference
- e) Only queries formally submitted in advance, will be answered in the pre-bid conference and will become part of the Corrigendum/Amendment.

35. Relaxation for Startup, MSEs, Make in India will be as per GOI norms.

SECTION 2: CONDITIONS OF CONTRACT.

1. The rate quoted should be FOR NITK, Surathkal for Indian supplier.
2. In case of import, CIF rates should be quoted. All components of expenditure to arrive by air at Bangalore need to be explicitly specified. If ship by sea, the nearest seaport is Mangaluru / Chennai. In both cases, the item should be landed at NITK Surathkal and this responsibility is with the bidder.
3. The institute is eligible for customs duty & GST exemption (for research related Procurement of Goods) & In the case of import, there will be no GST.
4. The rate quoted should be on per unit basis. Taxes and other charges should be quoted separately, considering exemptions, if any.
5. Rate quoted should be inclusive of Testing, Commissioning and Installation of Equipment and Training.
6. **Payment:** No advance payment will be made. Payment will be made only after the supply of the item in good and satisfactory condition and receipt of performance security by the supplier.

In case of Imports, the payment will be made through LC. Performance security needs to be submitted at the time of LC commitment.

7. Guarantee and Warranty period should be specified for the complete period conforming to Section 3 of this tender document.
8. The period required for the supply and installation of Equipment should be specified conforming to Section 3 of this tender document.

SECTION 3: SCHEDULE OF REQUIREMENTS, SPECIFICATIONS AND ALLIED DETAILS

[To be filled up by the Department / Center of NITK, Surathkal]

Item(s) Name to be Procured	: Single Cylinder Optical Research Engine (SCORE)
Type (Equipment/Software/Furniture/Others)	: Equipment
Brief Specifications of the Item(s) (Attach Additional Sheet if necessary)	: Annexure-H
Quantity	: One
Any other details/requirement	: Annexure-H
Warranty Period (in months)	: 36 Months (3 Years)
Delivery Schedule expected after the release of a Purchase order (in Weeks)	: 16 weeks (4 months)
EMD (2% of the estimated amount)	: Rs. 2,70,000/- (Rs. Two lakh seventy thousand)
Performance Security to be given by Successful Bidder after release of Purchase Order (in Rupees)	: 10% of Purchase Order



NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

SECTION 4 - PRICE BID (for indigenous Supplies) (Draft format only)

[To be used by the bidder for submission of the bid, should be submitted online only]

Reference Number:

Date:

Sl. No.	Description of the Item and Specification	Qty. in Units	Unit Price (Rs.)	Discount %	Excise/Customs Duty %	GST (%)	Other charges if any (please specify details)	Total Price (Rs.)

1. Delivery Mode: Delivery at NITK Surathkal, at the site only.

Total Bid Price in the above column should be inclusive of all taxes and levies transport, loading, unloading, etc.

Delivery Period: days.

Validity Date: Minimum 180 days from the date of submission of quotation/ tender.

2. Payment Term: Payment within 30 days from the date submission of bill Acceptance Certificate to concerned Dept./ Sect.

3. a) AMC Charges after warranty period :

b) Comprehensive AMC charges after warranty period :

Price Bids will be compared considering 3 a) or b). NITK reserves the right to consider 3 a) or 3 b) for price comparison.

PAN No.:

GST Registration No.:

Name & Business Address:

Place:

Date:

Note: Price Bid should be submitted in given format only (Refer BOQ – Attached excel sheet).



NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

SECTION 4 - PRICE BID (for Imported Supplies) (Draft format only)

[To be used by the bidder for submission of the bid, should be submitted online only]

Reference Number:

Date:

Sl. No.	Description of Items & Specifications	HSN/SAC Code	Quantity in Units	IGST %	Price basis (CIF)	Total Bid Price
	Installation and Commissioning Charges (if any)					
	Agency Commission (if any quote in %)					
	Other Charges (please specify details)					
Grand Total						

HSN Code: Harmonised System of Nomenclature Code no. and # SAC Code: Service Accounting Code no.

1. Delivery Period: days.
2. Validity Date: Minimum 180 days from the date of submission of quotation/ tender.
3. a) AMC Charges after warranty period :
b) Comprehensive AMC charges after warranty period:
Price Bids will be compared considering 3 a) or b). NITK reserves the right to consider 3 a) or 3 b) for price comparison.

1. The validity of the bid: 180 days from the date of submission of the quotation or tender.
2. Mode of Shipment: _____
3. Port of Shipment: _____

Place:

Date:

Note: Price Bid should be submitted in given format only (Refer BOQ – Attached excel sheet).

SECTION 5: CONTRACT FORM

[To be provided by the bidder in the business letter head]

1. (Name of the Supplier's Firm) hereby abide to deliver by the delivery schedule mentioned in section 3 tender document for supply of the items if the purchase order is awarded.

2. The item will be supplied conforming to the specifications stated in the tender document without any defect and deviations.

3. Warranty will be given for the period mentioned in the tender document and service will be rendered to the satisfaction of NITK, Surathkal during this period.

Signature of the Bidder : _____

Name and Designation: _____

Business Address : _____

Place:

Date:

Seal of the Bidder's Firm

Compliance Statement of Specifications

Sl.No.	Name of specification/Part/Accessories of tender enquiry	Specifications of the quoted Model / Item	Compliance Whether YES or NO	Deviations if any to be indicated in unambiguous terms

(Add more rows if required)

Signature and Seal of the Bidder

Previous Supply Orders Executed

Name of the firm: _____

Order placed by [Full address of the purchaser]	Order No. and Date	Order Value	Specified Delivery Date	Actual Delivery Date	Remarks indicating reasons for late delivery, if any and justification for the price difference of their supply order and those quoted to us	Has the equipment been installed satisfactorily?	Contact person along with telephone, mobile number, fax, and E-mail address

(Add more rows if required)

Signature and Seal of the Bidder

FORMAT OF DECLARATION
(To be submitted on Letterhead)

I/We Mr./Ms. _____, S/o/ of Mr. _____ aged about _____ years, resident of _____, working as -----(designation) for ----- (name and address of the bidding agency).

I solemnly affirm and the state as under:

1. That I am working as ----- /proprietor of the ----- (name of the firm) and authorized to sign this declaration.
2. That the firm M/s---- (complete address of the firm) has not abandoned or suspended any contract work of any organization/ department so far/ during the previous five financial years.
3. That the firm M/s---- (complete address of the firm) has not been blacklisted/ debarred for competing in tenders by any organization/ department so far/ during the previous five financial years.
4. I solemnly confirm that the facts stated above are true and nothing has been concealed.

Seal and Signature of Bidder

INTEGRITY PACT AGREEMENT

(To be signed by the bidder/same signatory authorized to sign the relevant contact)

This Integrity Agreement is made at Surathkal on this day of20

BETWEEN

National Institute of Technology Karnataka, Surathkal, an Institute of National Importance (under NIT Act -2007) represented through The Registrar, NITK, Surathkal (hereinafter referred as the '**Buyer**', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....
(Name and Address of the Individual/Firm/Company)

Through (Hereinafter referred to as the "Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its succession and permitted assigns)

Preamble

WHEREAS **NITK Surathkal** has floated the Tender (Tender No.: NITK/CRF/ME/SCORE/DOC04 dated: 13-09-2019) (Hereinafter referred to as "Tender/Bid") and intends to award, underlaid down organizational procedure, contract for "**Single Cylinder Optical Research Engine (SCORE)**"

[Hereinafter referred to as the "**Contract**").

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as "**Integrity Pact**" or "**Pact**"), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this witness as under:

Seal and Signature of the bidder

Registrar, for NITK Surathkal

Article 1: Commitment of NITK Surathkal

- i. **NITK Surathkal** commits to take all measures necessary to prevent corruption and to observe the following principles:
 - (a) No employee of NITK Surathkal, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - (b) NITK Surathkal will, during the Tender process, treat all Bidder(s) with equity and reason. NITK Surathkal will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
 - (c) NITK Surathkal shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- ii. If NITK Surathkal obtains information on the conduct of any of its employee which is a criminal offense under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, NITK Surathkal will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/ Contractor(s)

- 1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adheres to the highest ethical standers, and report to the Government / Department all suspected acts of **fraud or corruption or Coercion or Collusion** of which it has knowledge or becomes aware, during the tendering process and through the negotiation or award of a contract.
- 2) The Bidder(s)/Contractor(s) commit himself to take measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contact execution:
 - a. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contractor to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contractor.

Seal and Signature of the bidder

Registrar, for NITK Surathkal

- b. The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into an undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
 - c. The Bidder(s)/Contractor(s) will not commit any offense under the relevant IPC/PC Act. Further, the Bidder(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as
 - d. part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - e. The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and address of agents/representatives in India if any. Similarly, Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and address of foreign agents/representatives if any. Either the Indian agent on behalf of the foreign principals or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
 - f. The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- iii. The Bidder(s)/Contractor(s) will not instigate third persons to commit offenses outlined above or be an accessory to such offenses.
 - iv. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice **means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.**
 - v. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, there or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/her reputation or property to influence their participation in the tendering process).

Seal and Signature of the bidder

Registrar, for NITK Surathkal

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to NITK Surathkal under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidders/Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

- 1) If the Bidder(s)/Contractor(s), either before awarded or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 day notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determinate the Contract - if already executed, or exclude the Bidders/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. **Such exclusion may be forever or for a limited period as decided by NITK Surathkal.**
- 2) **Forfeiture of EMD/Performance Guarantee/Security Deposit:** If NITK Surathkal has disqualified the Bidder(s) from the tender process prior to the award of the Contract or terminate/determinate the Contractor has accrued the right to terminate/determinate the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to NITK Surathkal, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Security of the Bidders/Contractor.
- 3) **Criminal Liability:** If NITK Surathkal obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of Indian Penal code (IPC)/Prevention of Corruption Act, or if the Principal/Owner has substantive suspicion in this regard, NITK Surathkal will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

- 1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country conforming to the anti-corruption approach or with Central Government or State Government or any other Central/State Public Enterprises in India that could justify his exclusion from the Tender process.
- 2) If the Bidder makes an incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/Owner.
- 3) If the Bidder/Contractor can prove that he has resorted/recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

Seal and Signature of the bidder

Registrar, for NITK Surathkal

Article: 5 Equal Treatment of all Bidder/Contractors/Subcontractors

- 1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidders/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Sub-contractors/sub-vendors.
- 2) The Principal/Owner will enter into pacts on identical terms as this one with all Bidders and Contractors.
- 3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed pact between the Principal/Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6: Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contractor or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this pacts as specified above, under it is discharged/determined by the Competent Authority of NITK, Surathkal.

Article 7: Other Provisions

- 1) This Pact is subject to Indian Law, place of performance and jurisdiction is **Mangaluru**, the Headquarters of NITK Surathkal, who has floated the Tender.
- 2) Changes and supplements need to be made in writing. Side agreements have not been made.
- 3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In the case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- 4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 5) It is agreed on term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action was taken by the Owner/Principal in accordance with this **Integrity Agreement/Pact or interpretation thereof shall not be subject to arbitration.**

Seal and Signature of the bidder

Registrar, for NITK Surathkal

Article 8: LEGAL AND PRIOR RIGHTS

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contract documents with regard to any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....
(For and on behalf of NITK Surathkal)

.....
(For and on behalf of bidder/ contractor)

WITNESSES:

1.
(Signature, name, and address)

2.
(Signature, name, and address)

Place: Surathkal.

Dated:

Format for Bank Account details of the bidder

Name of the account holder (bidder)	
Complete address	
Contact number	
Email address	

Bank Account details:

Bank name	
Branch name	
MICR number	
Account type	
Account Number	
Please re-type Account number again	
IFSC code of the Bank	

I hereby declare that the particulars given above are correct and complete. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold the Institute responsible for this.

I have read the option invitation letter and agree to discharge responsibility expected of me as a participant under the scheme.

Seal and signature of the bidder.

Certification from the banker:

Certified that the particulars furnished above are correct as per our records.

Seal and signature of the authorized officer of the bank.

FORMAT FOR PERFORMANCE GUARANTEE BOND

(To be typed on Non-judicial stamp paper of the value of Indian Rupees of One Hundred) (TO BE ESTABLISHED THROUGH ANY OF THE NATIONAL BANKS (WHETHER SITUATED AT MANGALURU OR OUTSTATION) WITH A CLAUSE TO ENFORCE THE SAME ON THEIR LOCAL BRANCH AT MANGALURU OR ANY SCHEDULED BANK (OTHER THAN NATIONALISED BANK) SITUATED AT MANGALURU. BONDS ISSUED BY CO-OPERATIVE BANKS ARE NOT ACCEPTED.)

To,
Registrar,
National Institute of Technology Karnataka,
Srinivasnagar P.O., Surathkal
Mangaluru – 575025

LETTER OF GUARANTEE

WHEREAS National Institute of Technology Karnataka (Buyer) has invited Tenders vide Tender No..... Dt. for purchase of AND WHEREAS the said tender document requires that any eligible successful tenderer (seller) wishing to supply the equipment/machinery, etc.in response thereto shall establish an irrevocable Performance Guarantee Bond in favour of “**The Registrar, National Institute of Technology Karnataka, Surathkal**” in the form of Bank Guarantee for Rs (**10% (ten percent) of the purchase value**) and valid till **one year or up to warranty period whichever is later** from the date of issue of Performance Guarantee Bond may be submitted within 30 (Thirty) days from the date of Order Acknowledgement as a successful bidder.

NOW THIS BANK HEREBY GUARANTEES that in the event of the said tenderer (seller) failing to abide by any of the conditions referred in tender document/purchase order/performance of the equipment/machinery, etc. this Bank shall pay to National Institute of Technology Karnataka, Surathkal on demand and without protest or demur Rs (Rupees.....). This Bank further agrees that the decision of National Institute of Technology Karnataka, Surathkal (Buyer) as to whether the said Tenderer (Seller) has committed a breach of any of the conditions referred in the tender document/purchase order shall be final and binding.

We, (name of the Bank & branch) hereby further agree that the Guarantee herein contained shall not be affected by any change in the constitution of the Tenderer (Seller) and/ or National Institute of Technology Karnataka, Surathkal (Buyer).

Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed Rs. (Indian Rupees only).
2. This Bank Guarantee shall be valid up to(date) and
3. We are liable to pay the guaranteed amount or any part thereof under this bank guarantee only and only if National Institute of Technology Karnataka (NITK) Surathkal serve upon us a written claim or demand on or before.....(date). This Bank further agrees that the claims if any, against this Bank Guarantee, shall be enforceable at our branch office at situated at (Address of local branch).

Yours truly,
Signature and seal of the guarantor:
Name of Bank &Address:
Date:

Instruction to Bank: Bank should note that on expiry of Bond Period, the Original Bond will not be returned to the Bank. The bank is requested to take appropriate necessary action on or after the expiry of the bond period.

FORMAT FOR EARNEST MONEY DEPOSIT / BID BOND

(To be typed on Non-judicial stamp paper of value Indian Rupees One Hundred)

(TO BE ESTABLISHED THROUGH ANY OF THE NATIONAL BANKS (WHETHER SITUATED AT MANGALURU OR OUTSTATION) WITH A CLAUSE TO ENFORCE THE SAME ON THEIR LOCAL BRANCH AT MANGALURU OR ANY SCHEDULED BANK (OTHER THAN NATIONALISED BANK) SITUATED AT MANGALURU. BONDS ISSUED BY CO-OPERATIVE BANKS ARE NOT ACCEPTED)

LETTER OF GUARANTEE

To

Registrar,
National Institute of Technology Karnataka,
Srinivasnagar P.O., Surathkal
Mangaluru – 575025

IN ACCORDANCE WITH YOUR TENDER for the supply of, M/s.....
(hereinafter called the "Bidder") having its Registered Office at, wish to participate in the said bid for the supply as an irrevocable Bank Guarantee against Earnest Money Deposit for an amount of Rs. (Rupees.....) valid up to **(180 days from the date of issue of Bank Guarantee)**, is required to be submitted by the bidder as a condition precedent for participating in the said bid, which amount is liable to be forfeited by the Purchaser on (1) the withdrawal or revision of the offer by the bidder within the validity period, (2) Non acceptance of the Letter of Intent/Purchase order by the Bidder when issued within the validity period, (3) failure to execute the contract as per contractual terms and condition within the contractual delivery period and (4) on the happening of any contingencies mentioned in the bid documents.

During the validity of this Bank Guarantee:

We,(Bank name) having the registered office at.....guarantee and undertake to pay immediately on first demand by NITK Surathkal, an amount of Rs..... (Rupees.)without any reservation, protest, demur and recourse. Any such demand made by theNITK Surathkal shall be conclusive and recourse. Any such demand made by the purchaser shall be binding on the Bank irrespective of any dispute or difference raised by the Bidder.

The Guarantee shall be irrevocable and shall remain valid up to(180 days from the date of issue of Bank Guarantee) If any further extension is required, the same shall be extended to such required period on receiving instruction from the Bidder, on whose behalf the is Guarantee is issued.

Notwithstanding anything contained herein:

- * Our liability under this Bank Guarantee shall not exceed Rs..... (Rupees.....).
- * This Bank Guarantee shall be valid up to (date).
- * We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee Only and only if you serve upon us a written claim on or before (date).

This Bank further agrees that the claims if any, against this Bank Guarantee shall be enforceable at our branch office atsituated at(Address of local branch).

Yours truly,

Signature and seal of the guarantor: Name of Bank:

Address:

Date:

Instruction to Bank: Bank should note that on expiry of Bond Period, the Original Bond will not be returned to the Bank. The bank is requested to take appropriate necessary action on or after the expiry of the bond period

Detailed Technical Specifications**SINGLE CYLINDER OPTICAL RESEARCH ENGINE (SCORE)**

A. **OBJECTIVE OF THE SCORE** is to perform intensive research in the area of engines using conventional and alternate fuels, major focus on in-cylinder diagnostics coupled with emission performance and combustion all of which in turn provides invaluable outputs for developing new generation high performance engines. The entire engines system shall be installed on a turnkey basis and include erection of a suitable facility for the system.

Research on alternate fuels and DI diesel / gasoline engine to study fuel properties, impact of different engine components (ignition & injection system, piston geometry), combustion procedures (variable valve timing), control strategies (injector timing, injection pressure) and influence of counter measures for reduction of misfire, knock, pre-ignition, combustion noise, torsional vibration and thermal load on mechanical components. The engine should access which enables combustion visualization.

- Optical engines are used for studying,
 - In-cylinder flow
 - Combustion
 - Pollutant formation as part of combustion system development
 - Validation data for simulations
- Optical engines are,
 - Usually single cylinder with balancer shafts to balance 1st order and 2nd order unbalanced inertial forces
 - Requires optical access to combustion chamber
 - Laser-based optical techniques required two or more optical access
- Access methods to combustion chamber are,
 - Optical access
 - Optical access through the cylinder head
 - Optical access through the piston
 - Optical access through the sides (w/ transparent liner)
 - Endoscopic access

B. SPECIFICATIONS

- The scope of supply should include a single cylinder optical research engine with a modification kit to convert the diesel engine into a GDI / MPFI engine. This shall allow easy switch from diesel engine to gasoline engine testing and vice versa.
- Provision for gaseous fuel injection to be provided in addition to the conventional liquid injection.

1) Diesel Engine mode:

- Displacement approximately 0.500 liters.
- Max. speed 4000 rpm
- Approximate engine power rating to be mentioned. [XX kW].
- Max. firing pressure 1000 bar and above.
- Compression ratio 15-22 (adjustable)

The Sub components to include but not limited to

- CR Fuel Injector, solenoid magnetic type, max. 1800 bar
- High Pressure Fuel Pump, integrated into timing belt drive
- Fuel Rail with Pressure Sensor and Pressure Control Valve
- Safety Over pressure Valve
- Wiring harness and Sensors.
- Fully open electronic fuel injection system.
- Provision for creation and modification of load/speed maps via ECU application system interface.
- Control of fuel injection, rail pressure, ignition and cam phases should be supported.
- At least, up to 4 injection events per cycle e.g. two pre-injections, one main-injection and one post injection shall be possible.

2) Petrol Engine Mode:

- Displacement Volume approximately 0.5 liters
- Max. speed 6000 rpm
- Rated power: approx. 20 kW (natural aspirated)
- Low rotation inertia (less 0.75 kgm²)
- Combustion concept Homogeneous; Lambda 1
- Cylinder Pressure PFP 120 bar
- Compression ratio (CR): approx. 9 – 16 (adjustable)
- The Sub components to include but not limited to
 - High pressure injection pump
 - Fuel Rail

- Gasoline Direct Injector (solenoid, multi-hole type)
- Injector Driver
- Rail Pressure Control Valve

The module must have a rigid structure to test the engine at its limits. Must have easy access into the crankcase for easy assembly/disassembly of the connecting rod and provide access to mass balancer system and oil sump. Cylinder block shall allow the replacement of the cylinder liner. The basic layout must be for natural aspirated operation with possibility of extension for boosted operation. Must support high tumble combustion concept suitable for homogeneous ($\lambda = 1$) and supercharged operation.

C. SUB-SYSTEMS

- Active dyno with precise speed and load control (dyno control system)
 - Automation system including open ECU with the possibility to modify engine maps and control algorithm (rapid prototyping functionality).
 - Fuel measurement system including fuel conditioning for multi-fuel operation (gasoline, diesel, ethanol, bio diesel).
 - General data acquisition including sensors and signal conditioning for speed, torque, temperature, ambient air pressure, temperature and humidity.
 - Buffer vessel/tank for stabilization of exhaust gas pulsations including back pressure valve.
 - Blow-by measurement system.
 - Gas analyzer for CO, CO₂, O₂, NO_x, HC and Lambda.
 - Combustion analysis system.
 - System for high speed photography.

D. INTERFACES REQUIRED

Device Interfaces: The test bed control system (automation software) shall function as a test bed integration platform and it has to control and coordinate all devices delivered for the test bed operation and measurement.

E. ASAM STANDARD INTERFACES

- Support for state-of-the-art interfaces which comply with the ASAM standard.
- The ASAP3 interface to link an ECU application system (APS) with the test bed control system.
- Access to ASAM-ODS server for data storage and management.
- Additional tools to allow the quick and convenient administration of parameters and results.
- Media Control
- Reproducible ambient conditions on the test bed (coolant, oil, intake air, air humidity, fuel) to reduce the measured result scatter and, therefore, allow the precise comparability of measurements using PID controllers.

- Test bed control used for the startup, shutdown, and control and monitoring of peripheral test bed equipment. Local Parameter & Result Administration.
- A database management toolbox for the easy administration of parameters and result data in the local test bed database.

Additional Mandatory Requirements:

1. **General warranty is for 3 years from the date of successful installation, which is the minimum.**
2. **AMC for two years after warranty period needs to be quoted. L1 will be calculated considering AMC period. Payment for AMC will be done at the respective time.**
3. **The machine will be installed in a temporary place. Company may need to shift to another place within the campus, free of cost if required within 1-2 years.**
4. **Any breakdown/service issue is to be sorted out within 72 hours. In case of delay beyond 72 hours, the warranty period will be proportionally extended.**
5. **Companies have to ensure equipment lands at NITK.**

Checklist for BIDDERS

BIDDERS to indicate whether the following are enclosed/mentioned by striking out the non- relevant option and the relevant technical bid documents should be in order.

Sl. No.	Documents	Content	Document Attached
1	Technical Bid	Self-Attested copy of GST & PAN Number	(Yes /No) Pg. No.
2		Licence certificate for manufacture /supply of the item &Factory license. Registration with EPF and ESI	(Yes /No) Pg. No.
3		Undertaking that the successful BIDDER agrees to give a 10% Performance Security.	(Yes /No) Pg. No.
4		Catalogue of the Product with detailed product specifications.	(Yes /No) Pg. No.
5		Copy of the Balance Sheet	(Yes /No) Pg. No.
6		List of Owner/partners of the firm and their contact numbers (Bidder Information)	(Yes /No) Pg. No.
7		The contract form is given in section 5	(Yes /No) Pg. No.
8		Format of compliance statement of specification as per Annexure-'A'	(Yes /No) Pg. No.
9		Previous Supply Order as per Annexure-'B'	(Yes /No) Pg. No.
10		Declaration of abandoned or suspended any awarded service & Blacklist Certificate. Annexure 'C'	(Yes /No) Pg. No.
11		Integrity Pact. Annexure 'D'	(Yes /No) Pg. No.
12		Bank details of the bidder. Annexure 'E'	(Yes /No) Pg. No.
13		EARNEST MONEY DEPOSIT Annexure -G In case of exemption from submission of EMD, proof of registration with NSIC/MSME	(Yes /No) Pg. No.
1	Financial-Bid	Price bid	(Yes /No)

Seal and Signature of the bidder