



**SPONSORED RESEARCH, INDUSTRIAL CONSULTANCY AND
CONSULTANCY EDUCATION CELL
NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA**

Advertised Tender Enquiry

Department: Mechanical Engineering

Tender Notice No: NITR/PW/ME/2018/09

Date: 07/03/2018

Through

Important Dates

CPP Portal

(E-procurement)

Event	Date	Time
Pre-bid Conference	NA	NA
Last Date of submission of quotation	28/03/2018	11:00 AM
Date of Opening of Technical and Financial Bid	29/03/2018	11:00 AM

Dear Sir,

We intend to purchase the commodities specified below and invite quotations in accordance with the terms and conditions detailed in the bid document. If you are interested, kindly send your offer with prices and complete terms within the time mentioned above.

For any clarification:

Attention: - Prof. S.Murugan
Department of Mechanical Eng.,
NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA – 769 008, ODISHA
Phone: - 0661- 2462525
Mobile no- +91 9437140949
Email Id- murugans@nitrkl.ac.in

Yours sincerely,

Name: Prof. S.Murugan
Professor-In Charge IC Engines
Laboratory

Encl:

1. Schedule of requirement, specifications, dates etc.
2. Bid document containing detail terms and conditions.

1. Schedule of requirements

SI.No	Description of Goods/Service	Quantity
1.	<p>Single cylinder, four stroke, water cooled diesel engine with mechanical (Rope brake) dynamometer test set up with necessary accessories that include panel comprising fuel measurement device, air tank and air flow measurement device, exhaust gas calorimeter as per the description given in Annexure-1.</p> <p>Engine: Engine power output : 4.4 kW/5 HP Speed : 1500rpm Type of Cooling : Water cooling Starting : Crank starting Lubrication : Forced</p> <p>Dynamometer: Type : Rope Brake Dynamometer Cooling : Air Load Measurement method : Dead Weights Max Speed : 1500 rev/m HP : 5 HP Coupling Type : Direct on Engine Fly wheel</p>	01
2.	<p>Computerized single Cylinder, four stroke, oil cooled Petrol engine test set up with electrical dynamometer with combustion diagnostics and necessary accessories that include pressure transducer, crank position sensor, data acquisition system, computer, UPS, panel comprising fuel measurement device, air tank and air flow measurement device, exhaust gas calorimeter as per the description given in Annexure-2.</p> <p>Engine Engine power output : 2.5 HP Speed : 3000 rev/m Type of Cooling : Water cooling Starting : Crank starting Lubrication : Forced</p> <p>Dynamometer Type : Electrical Dynamometer Cooling : Air Load Measurement method : Lamp Load Max Speed : 3000 rev/m HP : 3 HP Coupling Type : Direct on Engine Fly Wheel Load method : Engine loading to be given from computer</p>	01

3.	<p>Cut section of Car model: This is a full scale working cut section model of an automobile car designed to enable students to study different systems of a passenger vehicle & demonstrate its working. The setup uses an actual automobile car, sectioned at suitable locations to display internal assemblies as per the description given in Annexure-3.</p> <p>Motor to drive the unit : Electrical motor Car model : TATA / Maruti or equivalent Car assembly : Engine, Transmission, Brake System, Engine Cooling System, Air Intake System etc.</p>	01
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2. Specifications and allied Technical Details

As per Annexure-I, II and III

3. Format of Quotation (tick appropriate box)

It is a single bid; please give all technical specifications and price bid in one envelope.

OR

It is a two part bid with separate techno-commercial and price bids. Please see item 1.12 of instructions for method of bidding.

4. The Bid should be submitted through e-procurement: <https://eprocure.gov.in/eprocure/app>

5. Quotations should be valid for a period of **90 days** from the closing date of the bid.

6. Some important dates:

i.	Pre- bid Conference:	Date: NA	Date: NA
ii.	Last date for receipt of quotation:	Date: 28/03/2018	Time: 11:00 AM
iii.	Opening of techno-commercial bid and financial Bid:	Date: 29/03/2018	Time: 11:00 AM

7. **Warranty** of **02** years must be provided.

8. **Excise Duty:** The Institute is exempt from Excise Duty. Please state applicable excise duty as a separate item.

9. **GST:** GST should be charge according to applicable rates (if applicable).

10. **Bid Security: Not Applicable**

11. **Performance Security: Not Applicable**

12. Please go through the enclosed "bid document" carefully for other bidding instruction

13. Please send your quotations through <https://eprocure.gov.in/eprocure/app>

14. For Technical Details you may contact to

Prof. S.Murugan
Professor In Charge, IC Engines Laboratory
Department of Mechanical Eng.
National Institute of Technology, Rourkela – 769 008
Phone:- 0661- 2462525, Mobile no- +91 9437140949
Email Id- murugans@nitrkl.ac.in

NB: Please furnish your Dealership Certificate (must) and Proprietary Nature Certificate (If applicable).



NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA – 769008, ODISHA

BID DOCUMENT

1. Instructions to the bidders:

- 1.1 Bids are invited on behalf of the Director, National Institute of Technology (NIT), Rourkela – 769008, Orissa, from the intending bidders for supply of the goods/stores/ equipments for the Institute as detailed in the enquiry letter.
- 1.2 The bidders should quote their offer/rates in BOQ in clear terms without ambiguity.
- 1.3 In case of any discrepancy between the rates in figures and that in words, the rate in words will be accepted as correct.
- 1.4 The last date for receipt of the bid is marked in the enquiry. In case the above date is declared a holiday for NIT, Rourkela, and the bids will be received up to the appointed time on the next working day.
- 1.5 The bids should be uploaded in <https://eprocure.gov.in/eprocure/app> Please follow the guidelines of the site.
- 1.6 If a prospective bidder requires any clarification in regard to the bidding documents, he may make a request the concerned officer or faculty member at least 14 days before the deadline for receipt of bids.
- 1.7 Bids received after the deadline of receipt indicated in para 1.4 above, shall not be taken in to consideration.
- 1.8 Each bidder shall submit only one bid. A bidder, who submits more than one bid, shall be disqualified and considered non-responsive.
- 1.9 (In respect of high value plant, machinery etc. of a complex and technical nature). The bids may be submitted in two parts, viz., technical bid and financial bid.
- 1.10 The bidder has to sign in full at all pages of the scanned part of the bidding document. No over-writing in those pages is acceptable.

2. Terms and Conditions of the bid:

- 2.1 The rates quoted should preferably be net, inclusive of packing, forwarding, freight, Insurance and all other incidental charges excluding taxes. In case these charges are quoted extra in addition to the quoted rates, the amount thereof or Ad Valorem rate must be specified. Packing, forwarding, freight etc., when quotes separately are reimbursable at actual. If external agencies are employed, their receipts must be enclosed with the invoice.
- 2.2 Duties and Taxes are to be quoted separately. Ad Valorem rates thereof should be clearly indicated with reference to the relevant Acts and Rules.

It may be noted that the Institute is exempt from paying Excise Duty vide Government Notification No. 10/97 dated 01.03.1997 [Registration No.: TU/V/RG-CD (227)/2011, dated 10.10.2011]. GST may be charged at applicable rates.

- 2.3 The goods are required to be delivered at the indenting Department of NIT, Rourkela, and must be dispatched within **60 days** from the date of placement of the supply of order under the risk and arrangement of the bidder and offers with delivery beyond the above period shall be treated as unresponsive. In case the delivery time is higher, the same must be mentioned clearly in the quotation.

- 2.4 The bid should remain valid for a period of **90 days** from the date of opening. In case your offer has a different validity period that should be clearly mentioned in the quotation.
- 2.5 Conditional discount, if any, offered by the bidder shall not be considered at the time of evaluation.
- 2.6 The goods offered should strictly conform to the specification and technical details mentioned in Annexure – I, Annexure – II, and Annexure – III.
- 2.7 The Institute may like to conduct pre-dispatch inspection of goods, where applicable.
- 2.8 Period of guarantee/warranty, where applicable, should be specified in the bid.
- 2.9 If the successful bidder, on receipt of the supply order, fails to execute the order within the stipulated period, in full or part, it will be open to the Director, NIT, Rourkela to recover liquidated damage from the firm at the rate of 1 percent of the value of undelivered goods per month or part thereof, subject to a maximum of 5 percent of the value of undelivered goods. Alternatively, it will also be opened to the Director, to arrange procurement of the required goods from any other source at the risk and expenses of the bidder.
- 2.10 The successful bidder may be required to execute a contract, where applicable.
- 2.11 The bidder has to furnish up to date GST and Income Tax Clearance Certificate along with the bid.
- 2.12 Payment (100 percent) will be made by Account Payee Cheque /Bank Draft, within 30 days from the date of receipt of the goods in good condition or receipt of the bill, commissioning of the equipment, and after successful installation and demonstration where ever applicable, whichever is later/latest.
- 2.13 In the event of any dispute arising out of the bid or from the resultant contract, the decision of the Director, NIT Rourkela shall be final.
- 2.14 The bid document/resultant contract will be interpreted under Indian Laws.

Technical Specification of Single cylinder, four stroke, water cooled diesel engine with mechanical (Rope brake) dynamometer test set up with necessary accessories

Engine set up

Engine Specifications

Engine power output	: 4.4kW/5HP
Speed	: 1500 rpm
Type of Cooling	: Water cooling
Starting	: Crank starting
Lubrication	: Forced

Dynamometer

Type	: Rope Brake Dynamometer
Cooling	: Air
Load Measurement method	: Dead Weights
Max Speed	: 1500 rev/m
HP	: 5 HP
Coupling Type	: Direct on Engine Fly Wheel

Fuel flow measurement:

A panel comprising burette and necessary valve arrangement to measure fuel flow . A stop watch must be provided.

Air flow measurement:

The test engine must be provided with a suitable air box(air plenum) with a necessary air flow measurement device.

Water flow:

A suitable arrangement to supply cooling water to engine and discharge out. A Rota meter with a suitable range must be provided.

Exhaust gas temperature measurement:

A panel comprising analog temperature measuring device with a range of 0-300°C using "K" type thermocouple.

Load of Rope Brake Dynamometer:

Dead Weights and Spring Balance must be provided for applying load to engine.

Others:

Necessary pipes must be provided for air supply, fuel supply and exhaust gas systems. A comprehensive teaching manual with full description with sample calculation must be provided.

Technical Specification of Computerized single Cylinder, four stroke water cooled petrol engine test set up with electrical dynamometer with combustion diagnostics and necessary accessories

Engine set up

Engine Specifications

Engine power output	: 2.5HP
Speed	: 3000 rev/min
Type of Cooling	: Water cooling
Starting	: Crank starting
Lubrication	: Forced

Dynamometer

Type	: Electrical Dynamometer
Cooling	: Air
Load Measurement method	: Dead Weights
Max Speed	: 3000 rev/m
HP	: 3 HP
Coupling Type	: Direct Type

Fuel flow measurement:

A panel comprising burette and necessary valve arrangement to measure fuel flow . A stop watch must be provided.

Air flow measurement:

The test engine must be provided with a suitable air box (air plenum) with a necessary air flow measurement device.

Water flow measurement:

A suitable arrangement to supply cooling water to engine and discharge out. A Rota meter with a suitable range must be provided.

Exhaust gas temperature measurement:

A panel comprising analog temperature measuring device with a range of 0-300°C using "K" type thermocouple.

Load of Electrical Dynamometer:

A suitable AC electrical dynamometer must be provided for applying load to engine.

Combustion diagnostics:

A pressure transducer (Kistler make or equivalent) with water cooling circuit and a crank position sensor must be provided for measurement of in-cylinder pressure, crank angle.

Data Acquisition System

A data acquisition system comprises 12 channels, 12 bit with 1 mega sample per second speed for processing the collected data from air flow, fuel flow, various temperatures from engine and exhaust gas measuring device, engine speed, engine load, pressure transducer, crank angle encoder.

Software: Windows based software with facility to export data in **CSV** format.

Others:

Necessary pipes must be provided for air supply, fuel supply and exhaust gas systems. A comprehensive teaching manual with full description and sample calculation must be provided.

Technical specification/description of Car model

A full scale working cut section model of an automobile car is designed to enable students to study different systems of a passenger vehicle & demonstrate its working. An actual automobile car, sectioned at suitable locations to display internal assemblies. The car assembly along with drive system is mounted on a sturdy steel frame, fitted with castor wheels for mobility. The demonstration system consists of a sectioned car (TATA / Maruti or equivalent). All the assemblies like Engine, Transmission, Brake System, Engine Cooling System, Air Intake System etc are sectioned in order to show the internal assemblies & parts. While running at lower speed by using an electric motor, the students can visualize the operation of important vehicle systems like an engine, gearbox, differential, power transfer to wheels. The engine is driven from flywheel end using a low-speed motor. All the car assembly must be repainted using automotive grade paints & colour coded to understand the sectioned parts.

The engine is cut at different locations in order to display its components like the piston, cylinder, crankshaft, camshaft etc. Auxiliary systems like the oil pump, starter, alternator, radiator, air cleaner etc. are also cut in order to show their construction details.

The gearbox is sectioned in order to show the internal meshing gears & their shifting during operation of the car.

The electrical system consisting of Head Lamps, Tail Lamps, Turn Indicators, Wipers, Horn etc is operational along with other mechanical systems.

The cut section of car must be capable to demonstrate

- a) Automotive Engine.
- b) Transmission System
- c) Brake System used in vehicles
- d) Demonstration of Automotive Electrical System.