

# INDIAN MARITIME UNIVERSITY MUMBAI PORT CAMPUS TENDER FOR "SUPPLY, INSTALLATION AND AMC OF APPLIED MECHANICS LABORATORY" at IMU Mumbai Port campus, Hay Bunder Road TENDER NO – IMU-MPC/PUR/2020-21/Appld. Lab./16

## VOLUME - I

## **TECHNICAL BID**

Issue of Tender Document	: 31.03.2021
Pre-Bid Meeting	: 1200 Hrs on 08.04.2021
Last Date for Submission	: up to 1700 Hrs on 19.04.2021
Opening of Technical Bid	: 1430 Hrs on 20.04.2021
Earnest Money Deposit (EMD)	: NIL
Estimated Cost	: 3.5 Lakhs

[Bidders are advised to study the Tender Document (including all Sections, Schedules and Annexure etc.,) carefully. Submission of Tender shall deem to have been done after careful study and examination of the Tender Document with full understanding of its implications.]

All bidders are requested to visit IMU Mumbai Campus website : <u>www.imumumbaiport.ac.in</u> & <u>www.imu.edu.in</u> for regular updates.

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#### INDIAN MARITIME UNIVERSITY (A central University, Govt. of India) Mumbai Port Campus, Mumbai - 400033

#### TENDER NO. IMU-MPC/PUR/2020-21/Appld. Lab/16 TENDER FOR "SUPPLY, INSTALLATION AND AMC OF APPLIED MECHANICS LABORATORY" AT IMU MUMBAI PORT CAMPUS

#### 1. <u>OBJECTIVE:-</u>

IMU Mumbai Port Campus is inviting open tenders from qualified bidders for providing "SUPPLY, INSTALLATION AND AMC OF APPLIED MECHANICS LABORATORY" at IMU Mumbai Port Campus, Hay Bunder Road, Mumbai – 400033.

#### 2. PRE-QUALIFICATION CRITERIA:-

The eligible bidder has to satisfy the following condition

Sr. No.	Qualification Criteria	Supporting Documents	Bidder Confirmation with Page No.
2.1.	The bidder should possess valid trade license, PAN and GST Registration Certificate	Copy of trade license, PAN, GST Certificates should be submitted with application.	
2.2.	Bidder should be a Manufacturer or an authorized dealer.	In case of bidder is an authorized dealer, letter of authorization from OEM shall be submitted and in case of manufacturer BIS certificate should be submitted.	
2.3.	The bidder should have average annual turnover of Rs. <b>1.5 Lakhs</b> during the last 03 financial years (i.e. 2017-18, 2018-19, 2019- 20).	<ol> <li>Copy of Profit &amp; Loss Account of the company for each of the 3 years authenticated by a C h a r t e r e d Accountant.</li> <li>Copy of Income Tax return for each of the 3 years authenticated by a Chartered Accountant</li> </ol>	

#### 3. EARNEST MONEY DEPOSIT (EMD):-

Every bidder shall submit a bid security declaration in the attached format as Annexure III.

#### 4. <u>Security Deposit:-</u>

4.1. Within 07 days of the successful bidder's receipt of notification of award from IMU -MPC, the Bidder shall furnish a Security Deposit at the rate of 03% of the contract value in the form of an A/C Payee Demand Draft drawn in the name of Indian Maritime University - Mumbai Port Campus, payable at Mumbai towards due compliance of contract obligations to the satisfaction of the IMU - MPC and to make good any loss or damage caused to the IMU - MPC owing to acts in pursuance/violation of terms herein. Security Deposit will be refunded / returned without any interest only 90 days after successful completion of AMC period. The refund or return of Security Deposit is subject to the complete fulfillment of the contract obligation by the supplier to the satisfaction of IMU and after adjustment of dues to IMU or penalty imposed by IMU.

#### 5. GENERAL INSTRUCTION:-

5.1. **Sale of Documents:** The Tender document can be downloaded free of cost from the IMU website <u>www.imu.edu.in</u> and <u>imumumbaiport.ac.in</u>.

#### 5.2. **Submission:**

- 5.2.1. The Tender shall be submitted in tender box which will be placed at the Main Gate of IMU-MPC, addressed to **THE DIRECTOR, INDIAN MARITIME UNIVERSITY, MUMBAI PORT CAMPUS, HAY BUNDER ROAD, MUMBAI-400033 up to date mentioned in cover page.**
- 5.2.2. The tenderer's shall seal the Technical-Bid and Price-Bid in separate envelopes (Cover-1 and Cover-2) duly marking the envelopes as **"Cover-1-Technical Bid"** and **"Cover-2-PriceBid"**. The two envelopes along with the covering letter, EMD, Power of Attorney, if any shall then be sealed in an outer envelope.
- 5.2.3. The main envelope shall contain the following:

## **Outer Envelope**

- (a) Covering Letter;
- (b) Earnest Money Deposit Demand Draft;
- (c) Sealed Cover 1; and
- (d) Sealed Cover 2

## Cover-1 – Technical Bid

- a. Duly filled in Tender-Document with relevant details and complete in all respects. (Except price bid)
- b. Documents in support of pre-qualification criteria as mentioned in para 2.1 to 2.3
- c. Annexure I (Compliance matrix to be filled and signed)
- d. Annexure II (Mandate Form)
- e. Annexure III (Bid Security Declaration)
   Cover –2 Price Bid
   PRICE BID/COVER duly filled in (both in figures and words).
- 5.2.4. The IMU-MPC, in exceptional circumstances, and at its sole discretion, may extend the tender due date by issuing a corrigendum.
- 5.2.5. The tenders will be opened in the presence of the representatives of the tenderers who choose to attend the tender opening (The maximum number of representatives attending the technical bid opening to be limited to 01 person).
- 5.2.6. The financial bids of the bidders who are technically qualified will be opened. The Bidders are requested to visit IMU Mumbai port Campus website <u>www.imu.edu.in</u> and <u>www.imumumbaiport.ac.in</u> for updates.
- 5.2.7. IMU reserves the right to cancel or withdraw the tender any time. IMU also reserves the right to reject any or all tenders without assigning any reason.
- 5.2.8. The bidder shall read and understand the contents of the tender documents, carefully. Failure to comply with the requirements of tender submission will render the tender liable for rejection. Tenders, which are not responsive to the requirements of the tender conditions, will be rejected.

#### 6. Validity:

The offer will remain valid for a period of 120 days from the date of opening of tender. If required, the validity shall be extended for further period by mutual consent.

# 7. Evaluation of Bids:

## 7.1. **Technical Bid Evaluation:**

- 7.1.1. The information furnished by the bidder in Cover I in the prescribed format supplied by IMU- MPC will form the basis for the technical evaluation.
- 7.1.2. In exceptional cases IMU- MPC or his representative reserves the right to obtain any clarifications from any of the bidder without vitiating the tendering process.
- 7.1.3. After satisfying that all / or some of the bidders have attained the minimum qualifying criteria as detailed above, bids of only the technically qualified bidders who fulfill all the pre-qualification / eligibility criteria, will be considered for opening of financial bids.

## 7.2. **Financial Bid Evaluation:**

- 7.2.1. The bidder quoting price for Lab equipment has to quote for its AMC as well, else the bid will be rejected.
- 7.2.2. The L1 will be calculated as per formula [Rates quoted for items + Average of two years AMC rates quoted]

#### 8. Inspection & Rejection:

The supply may be subject to inspection by IMU-MPC and IMU's decision to the acceptance of any equipment or rejection of any equipment/goods as not conforming to specification shall be final and binding on the successful bidder. Such of the equipment / goods which are rejected shall be removed by the successful bidder at their own expense and replaced by fresh ones within a time, as determined by IMU.

#### 9. Payment Terms:

### 9.1. New Equipment:

- 9.1.1. No advance payment will be made.
- 9.1.2. The Supplier shall be paid 100% of payment against Supply, Installation, Commissioning, Acceptance Testing, Training and putting in to operation of equipments at designated place against the invoice. IMU will, after verification of the claim for its correctness, make payment within Thirty days after the date of receipt of the claim, complete and correct in all respects, from the supplier.
- 9.1.3. Up to 30% of total payment may be considered against supply of complete material prior to installation on case to case basis. Additional up to 30% payment may be considered after completion of installation. Balance payment after Commissioning, Acceptance Testing, Training and putting in to operation of equipments at designated place against the invoice.

#### 9.2. Annual Maintenance Contract:

9.2.1. In respect of AMC, AMC charges will be paid at the end of each AMC period.

#### **10.** Clarification / Information:

A bidder requiring any clarification regarding the tender documents may notify in writing to the address mentioned in the invitation of tenders or E-Mail to **procurement.mumbaiport@imu.ac.in** with a copy to **director.mumbaiport@imu.ac.in**. IMU-MPC will respond to any valid request for clarification, raised during the pre-bid meeting or received one week prior to the last date for submission of tenders. IMU-MPC's decision is final and binding with regard to interpretation of terms used or other tender contents.

# 11. Scope of Work:

11.1. <u>Supply, Installation and AMC Of Applied Mechanics Laboratory as mentioned in</u> <u>the table below: -</u>

SI. No.	Name of the Equipment	Qty
1	Wall Crank Apparatus.	01 Unit
2	Shear Leg apparatus.	01 Unit
3	Derrick Crane apparatus.	01 Unit
4	Bell Crank lever Apparatus.	01 Unit
5	Simply Supported Beam Apparatus.	01 Unit
6	Coefficient of Friction between leather , metal & inclined plane.	01 Unit
7	Screw Jack Simple Machine Apparatus.	01 Unit
8	Apparatus to prove that the Efficiency of a square thread is greater than V-thread.	01 Unit
9	Determination of the co-efficient of friction for both flat belt and V-belt with belt friction apparatus and hence find the slip.	01 Unit
10	Centrifugal Clutch Apparatus.	01 Unit
11	Determination of the characteristic curves of sleeve position against speed of rotation for a. Hartnell Governor b. Porter Governor c. Proell Governor	01 Unit
12	Determination of the moment of Inertia of different bodies by the Trifilar Suspension Experiment & by Calculation Apparatus.	01 Unit

11.2. **Supply of Equipment:** The supply shall include complete set of equipment including accessories, spares and consumables as described in the subsequent paragraphs of the <u>"Technical Specification"</u> along with the pedestal for easy accessibility for the trainees (Annexure - I).

#### 11.3. **Installation, Demonstration and User Acceptance Testing:**

- 11.3.1. The supplier is required to supply the items within 30 days of the issuance of the work order and do the installation and demonstration of the equipment within 15 days of the arrival of materials at the IMU's site of installation; otherwise the penalty clause will be the same as per the supply of materials.
- 11.3.2. The successful Bidder shall depute their Service Engineer for demonstration / calibration/ conduct of demo experiments of the equipment.
- 11.3.3. The acceptance tests for supplied goods shall be carried out at IMU by the supplier with the participation of concerned personnel from IMU-MPC.
- 11.3.4. The supplier shall provide necessary consumables till the completion of acceptance testing, without any additional cost.

- 11.3.5. All parts and equipment should be brand new and unused. Refurbished items shall not be accepted.
- 11.3.6. The equipment shall be robust for academic use and shall have to produce results with accuracy, as determined reasonable by IMU.

## 11.4. **Documentation:**

- 11.4.1. The successful bidder shall provide IMU with necessary documents including the following:
  - 11.4.1.1. Operational and Maintenance Manuals of equipment.
  - 11.4.1.2. Equipment serial numbers and models.
  - 11.4.1.3. Test Certificates, Licenses if any.
  - 11.4.1.4. Acceptance test results and acceptance status.
  - 11.4.1.5. Training Material.
  - 11.4.1.6. Full documentation with the software. (if applicable)
- 11.4.2. Two sets of hardcopy of the above shall be handed over to nominated personnel of IMU. Soft copy of the documents shall also be provided where applicable. Handing over of documents to IMU by supplier is a pre-requisite for Acceptance.
- 11.4.3. Manuals for the instruments are to be supplied with respect to operation, maintenance, ordering spares / technical services.
- 11.4.4. A video clip on the operation of equipment shall be made available as applicable.
- 11.5. **Site Preparation:** The supplier must provide complete details regarding space and all the other infrastructural requirements needed for the equipment, which IMU should arrange before the arrival of the equipment to ensure its timely installation and smooth operation thereafter. The supplier shall visit the IMU Campuses and see the site where the equipment is to be installed and may offer his advice and render assistance regarding specification, material and associate fittings/ fixtures required for preparation of the site and other preinstallation requirements, to bring the equipments at the stage of operation, within One week of issuance of order.

#### 11.6. **Acceptance of Equipment:**

- 11.6.1. The activity shall deem to have been completed with the completion of Supply, Installation, Servicing, Repairs and putting in to operation of equipments at IMU MPC. However, the supply shall be complete only upon certification to this effect issued by IMU-MPC.
- 11.6.2. The warranty period for the supplied system would commence from the date of Acceptance by IMU separately for each Campus.
- 11.7. **Replacement of Defective Equipment:** If any of the equipment supplied by the supplier is found to be substandard, refurbished, un-merchantable or not in accordance with the description/specification or otherwise faulty, the IMU will have the right to reject the equipment or its part. The prices of such equipment shall be refunded by the supplier with 18% interest per annum if such payments for such equipment have already been made. All damaged or unapproved goods shall be returned at suppliers cost and risk and the incidental expenses incurred thereon shall be recovered from the supplier. Defective part in equipment, if found before installation and/or during warranty period, shall be replaced within 30 days on receipt of the intimation from this office at the cost and risk of supplier including all other charges. In case supplier fails to replace above item as per above terms & conditions, IMU may consider 'Banning' the supplier and any other remedies, as deemed fit by IMU-MPC.

## **12.** Comprehensive Onsite warranty:

- 12.1. A comprehensive onsite warranty for the supplied equipment shall be provided by the supplier for a minimum of **Three year** from the date of final acceptance of the equipment by IMU. The supplier will be notified of any defect or claim arising under this warranty and the warranty support shall be provided at site of IMU Campuses.
- 12.2. If the supplier having been notified fails to remedy the defect immediately as per 13.2, IMU may proceed to take such remedial action as may be necessary at the supplier's expense. The period that the equipment is out of commission / operation as a result of supplier's failure to remedy the defects notified shall result in extension of the warranty period correspondingly and imposition of penalty (Rs.2,000/-(Rupees Two Thousand only) per instance which will be adjusted from the Security Deposit or any other dues to the supplier).

#### 13. Comprehensive On-site AMC:

- 13.1. Comprehensive AMC for **Two years** is to commence immediately after the expiry of the comprehensive Three years warranty period for items mentioned in "Annexure I".
- 13.2. The supplier shall provide necessary comprehensive preventive and corrective maintenance on site i.e., by sending the engineer to the IMU Campuses for attending the maintenance requirements of the supplied equipment. In case of intimation of breakdown, the successful bidder should respond within 48 hours of reporting during the period of AMC. All spares which need replacement during the period of onsite maintenance are to be replaced without any additional cost. The conditions specified for warranty will be applied by during AMC period and vice-versa.
- 13.3. In addition to above, support should also be available by phone, e-mail to solve the problem as soon as possible during the period of Warranty and Annual Maintenance Contract. He shall have facilities with sufficient service engineers trained to provide support services. The Bidder shall also have sufficient spares on hand for providing the uptime as indicated in this tender.

# **TECHNICAL SPECIFICATION AND COMPLIANCE MATRIX**

SI. No.	Name of the Equipment	Specifications	Compliance to Specification YES/NO
1.	Wall Crank Apparatus.	Standard wall or table mounted apparatus designed to determine the magnitude and nature of forces acting on different members of the Wall Crank. The forces are measured by compression & tension spring balances.	
2.	Shear Leg apparatus.	The Shear Legs are often used to make temporary lifting device. The standard Shear Leg apparatus is free standing on a bench/table top. The apparatus is mounted on a sturdy wooden base with provision for changing the width/distance between the two front legs and the position of the back stay with respect to front legs. The forces in the members are measured by two compression & one tension spring balances, pan & weights.	
3.	Derrick Crane apparatus.	Standard wall or table mounted apparatus to enable to determine the magnitude and nature of forces acting on different members of the Derrick Crane. The forces are measured by compression & tension spring balances.	
4.	Bell Crank lever Apparatus.	Standard Bell Crank Lever apparatus mounted on wooden base. A wooden right angled lever with fulcrum at the angle, the horizontal arm is of 75 cm.(approx.) and vertical arm is of 20cm (approx.), A spring balance with adjustable wing nut is attached to the shorter arm. The lever arm is with scale and grooved at every 5cm. Self-contained bench mounted with 5 different lever ratio. Direct readout of reaction by spring balance. An arrangement to enable the measurement of the reaction force of a 90° bell crank by a spring balance when a load is applied at any of the five leverage ratio.	
5.	Simply Supported Beam Apparatus.	Standard Simply Supported Beam Apparatus Specifications: A graduated horizontal beam of length L = 1m approx. Beam supported at two ends on Compression Spring Balances. Sliding Hooks: To adjust the position of weights & moment arm. Weights: 1 Kg., 2 Kg., 500 g. (3 each) The apparatus is to verify the law of moments using parallel forces produced in Simply Supported Beam Apparatus & other related experiments.	

6.	Coefficient of Friction between leather , metal & inclined plane.	Standard Coefficient of Friction Apparatus: Mounted on a rigid base. Adjustable angle inclined plane having arrangement for setting the required angle precisely with graduated arc/protractor & adjustable pulley attached at the top end. Wooden Block with hook, Wooden Block with hook & leather attached to its base, Mild steel Block with hook or Cast Iron Block with hook. Weight Hanger, set of weights.	
7.	Screw Jack Simple Machine Apparatus.	Standard Screw Jack Simple Machine Apparatus: Rigid Stationary Base Nut: To be mounted on the table top. Square thread, Pitch 5 mm. Square threaded bolt: 30 mm diameter, 5 mm pitch bolt/screw with load disc pulley/turn table of diameter 20 cm at the other end. An arrangement to mount the two auxiliary/ jockey pulleys to the top of the rigid base nut along with the pulley height adjuster to be provided. Effort pans, weights to be provided.	
8.	Apparatus to prove that the Efficiency of a square thread is greater than V- thread.	To verify that the efficiency of a Square thread is greater than that of a V-thread. Could not find specification of this apparatus.	
9.	Determination of the co- efficient of friction for both flat belt and V-belt with belt friction apparatus and hence find the slip.	Standard Belt Friction Apparatus should enable to perform experiments to study belt friction. The core unit is a cast iron pulley with grooves in its circumference for V-belts, Flat belts. The pulley is mounted in ball bearings and operated with a hand crank. The apparatus should have an arrangement to adjust the angle of contact from $30^{\circ}$ to $180^{\circ}$ in $15^{\circ}$ steps. Two spring balances to measure the tensile forces at each end of the belts. Provide for belt tension adjustment using a threaded spindle. Wall mounted. Belt Pulley: D = 300 mm (approx.); Material: Cast Iron. 2 Flat belts, $15 \times 2.5$ mm approx., leather/ polyamide or equivalent. 2 V-belts, $10 \times 8$ mm approx., rubber/fabric. Ball bearing mounted belt pulley with two different belt grooves. One Flat & the other V. Provision for adjustment of angle of contact between $30^{\circ}$ to $180^{\circ}$ in $15^{\circ}$ steps. Belt tension measurement using 2 spring balances.	
10.	Centrifugal Clutch Apparatus.	Standard Centrifugal Clutch – Working Model The model be supplied with a drum pulley mounted on the output shaft. The input shaft carrying spring controlled fly weights. The working should be demonstrated by rotating the input shaft provided with hand operated crank handle. The output shaft should rotate with clutch action.	

11.	Determination of the characteristic curves of sleeve position against speed of rotation for a. Hartnell Governor b. Porter Governor c. Proell Governor	Standard table top mounted Universal Governor apparatus: Material for Spindle: Stainless Steel. Governor Mechanism: Four different types of governor mechanism with spring and weights. Watt Governor, Porter Governor, Hartnell Governor, Proell Governor. Digital RPM Indicator with proximity sensor. Variable speed DC motor. RPM: 0-700 (approx.) with thyristor controlled D.C Drive for variable speed. Control Panel: For speed control of motor. The whole set-up is well designed and arranged on a rigid structure painted suitable industrial paint.	
12.	Determination of the moment of Inertia of different bodies by the Trifilar Suspension Experiment & by Calculation Apparatus.	<ul> <li>Standard Trifilar Suspension Apparatus:</li> <li>Designed to perform rotary pendulum oscillation experiments with 3 different bodies on trifillar pendulum.</li> <li>Quick action clamps for the suspension cords.</li> <li>Suspension cord length up to 2000 mm possible.</li> <li>Bars: Made of galvanized mild steel <ul> <li>Lx W x H: 40 x 40 x 160 mm approx.</li> <li>Mass: 2 Kg approx.</li> <li>Cylinder: Made of galvanized mild steel.</li> <li>D x h: 160 x 20 mm approx., Mass: 3 Kg.</li> </ul> </li> <li>Hollow Cylinder: Made of galvanized mild steel <ul> <li>:Outer Diameter: 100 mm approx.</li> <li>:Inner diameter: 100 mm approx.</li> <li>:Chord Length: Up to 2000 mm.</li> </ul> </li> <li>Wall Mounted Bracket having provision for suspension of Trifilar pendulum: W x H: 250 X 300 mm approx.</li> <li>The bodies used in the experiments have strong steel hooks for attachment to the suspension cords.</li> <li>An arrangement to change the length of suspensions cords rapidly and securely fix quickly by using clamps.</li> </ul>	

#### MANDATE FORM

(Account/s Information form) REAL TIME GROSS SETLEMENT (RTGS)/ NATIONAL ELECTRONIC TRANSFER (NEFT) / INTRA BANK ACCOUNT TRANSFER FACILITY FOR RECEIVING PAYMENTS FROM IMU.

A. DETAILS OF ACCOUNT HOLDER:

NAME OF ACCOUNT HOLDERER / FIRM

COMPLETE CONTACT ADDRESS

**MOBILE NUMBER / PH NO** 

E.MAIL:

PAN:

B, BANK ACCOUNT DETAILS:

ACCOUNT NAME (Name appearing in your Cheque Book) BRANCH NAME WITH COMPLETE ADDRESS, TELEPHONE NO BRANCH CODE Note: Please attach a Cancelled Cheque along with the account information form.

COMPLETE BANK ACCOUNT NUMBER (Please note that the Bank Account must be in the name of the Firm as appeared in the bill. In case of other Beneficiaries (Non-vendor) the Account name must be in the name of Applicant)

IFSC CODE

TYPE OF ACCOUNT (SB/CURRENT/CASH CREDIT)

MICR CODE OF 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 IMU responsible.

( .....) Signature of Beneficiary Date:

Mandatory for Vendors/suppliers/Contractors etc., Payment: Certified that the particulars furnished above are correct as per our records. (Bank's Stamp with Date & Place)

( ...... )

Signature of Bank Manager

#### Annexure -III

## FORMAT OF BID SECURITY DECLARATION

I/We-----

------ hereby states and understand that, if I/We ------

\_\_\_\_\_

withdraw/modify our tender during the period of validity of the tender, The Indian Maritime University, Mumbai Port Campus would suspend the bidder from participation in any future tenders of Indian Maritime University for a period of Six (06) months.

Signature	
Name	
Capacity in which	n signed

Seal of the firm to be affixed.

Date Place



# INDIAN MARITIME UNIVERSITY MUMBAI PORT CAMPUS TENDER FOR "SUPPLY, INSTALLATION AND AMC OF APPLIED MECHANICS LABORATORY" at IMU Mumbai Port campus, Hay Bunder Road

TENDER NO – IMU-MPC/PUR/2020-21/Appld. Lab./16

# VOLUME - II

## FINANCIAL BID

[Bidders are advised to study the Tender Document (including all Sections, Schedules and Annexure etc.,) carefully. Submission of Tender shall deem to have been done after careful study and examination of the Tender Document with full understanding of its implications.]

All bidders are requested to visit IMU Mumbai Campus website : <u>www.imumumbaiport.ac.in</u> & <u>www.imu.edu.in</u> for regular updates.

#### PRICE BID

## [On the Letter head of the Bidder and to be put in sealed cover]

### SUPPLY, INSTALLATION AND AMC OF APPLIED MECHANICS LABORATORY

(Amount in Rs.)

						(Amour	
SI. No.	Name of the Equipment	Qty.	Price of the equipment	AMC Charges for 1 <sup>st</sup> year after Warrantee	AMC Charges for 2 <sup>nd</sup> year after Warrantee	Total	
		1	2	3	4	6 = (2+3+4)	
1	Wall Crank Apparatus.	01 Unit					
2	Shear Leg apparatus.	01 Unit					
3	Derrick Crane apparatus.	01 Unit					
4	Bell Crank lever Apparatus.	01 Unit					
5	Simply Supported Beam Apparatus.	01 Unit					
6	Coefficient of Friction between leather , metal & inclined plane.	01 Unit					
7	Screw Jack Simple Machine Apparatus.	01 Unit					
8	Apparatus to prove that the Efficiency of a square thread is greater than V- thread.	01 Unit					

9	Determination of the co-efficient of friction for both flat belt and V-belt with belt friction apparatus and hence find the slip.	01 Unit				
10	Centrifugal Clutch Apparatus.	01 Unit				
11	Determination of the characteristic curves of sleeve position against speed of rotation for a. Hartnell Governor b. Porter Governor c. Proell Governor	01 Unit				
12	Determination of the moment of Inertia of different bodies by the Trifilar Suspension Experiment & by Calculation Apparatus.	01 Unit				
	Total:					
	(Total in				wo	RD)
	The rates quoted above should be only the unit price (i.e. inclusive of basic price, transportation and any other charges) and exclusive of GST and any cess on GST.					

Date:

Place:

Stamp & Signature of Bidder