

	<p>भारतीय प्रौद्योगिकी संस्थान पालक्काड <b>Indian Institute of Technology Palakkad</b> अहलिआ एकीकृत कैम्पस, कोज़िहपारा Ahalia Integrated Campus, Kozhipara पालक्काड- 678557 Palakkad – 678 557</p>	<p>दूरभाषसंख्या/ Phone no: 04923 – 226300/590/586 ईमेल/ Email : purchase@iitpkd.ac.in</p>
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Ref No: IITPKD/ELE/SS/039/2017

Date: 04.10.2017

**Due Date of the tender: 20.10.2017 @ 3 PM**

### **TENDER FOR INVITING QUOTATIONS**

Dear Sirs,

On Behalf of Indian Institute of Technology Palakkad quotations are invited for “**Make Your Own Machine Lab**” confirming to the specification in the Annexure.

- 1. Preparation of Bids:** - The tenders should be submitted **under two-bid system** (i.e.) Technical bid and Financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. No prices should be included in technical bid. Financial Bid should indicate item – wise prices for the items mentioned in the technical bid. The technical and the financial bids should be put in separate cover and sealed. Both sealed covers should be put into a bigger cover.
- 2. The Quotations** duly sealed and superscribed on the envelope **with the reference No. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above. Fax and Email quotation are not acceptable.**
- 3. The price** should be quoted per unit and packing and delivery charges should be indicated separately. The offer/bids should be exclusive of Taxes and Duties, which will be paid by the purchaser as applicable. However the percentage and of taxes and duties as on date should be clearly indicated.
- 4. The Quotations** should be valid for **sixty days** from the due date and the period of delivery required should also be clearly indicated.
- 5. If the item** is under DGS&D Rate contract No. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price (Please note that we are not Direct Demanding Officers). If so please send copy of the RC.
- 6. Local Firms:** Quotations should be for free delivery to this Institute. If Quotations for Ex-Godown delivery charges should be indicated separately.
- 7. Outside Palakkad:** Quotations should be for **F.O.R. at IIT Palakkad**. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If Ex-Godown, packing, forwarding and freight charges must be indicated.

8. Goods shall not be supplied without an official supply order.
9. **Custom Duty:** Custom Duty which will be paid at a concessional rate against duty exemption certificate.
10. **Payment:** Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later. No advance payment will be made. The Tenderer have to furnish the bank details along with tender like Account No, Account Name, IFSC Code, Bank address etc.
11. **Submission of Bids:** Quotation should be sent to the following address “**The Registrar, Indian Institute of Technology Palakkad, Ahalia Integrated Campus, Kozhipara, Palakkad -678 557, Kerala**”, Phone No: **04923 226 586/590**, Email: [purchase@iitpkd.ac.in](mailto:purchase@iitpkd.ac.in).
12. **Delivery Period:** The quotation should indicate clearly when delivery and installation to be made.
13. **Delay in Supply or Liquidate damages:** If the supplier fails to deliver the stores within the time specified in the purchase order, the purchaser will recover from the supplier as liquidated damages a sum of one- half of one percent (0.5%) of the P.O value of the undelivered stores for each calendar week of delay. The total liquidated damages shall not exceed five percent (5%) of the P.O price of the unit or units so delayed. Stores will be deemed to have been delivered only when all their component parts are also delivered. If certain components are not delivered in time, the stores will be considered as delayed until such time as the missing parts are delivered.
14. **Late offer:** The quotation received after due date will not be considered. Please ensure that your offer is sent well in advance to reach the Institute by the due date.
15. **Loading and unloading charges will be borne by the supplier.**
16. **Warranty:** Warranty Clause should be indicated clearly.
17. **Acceptance and Rejection:** IIT Palakkad has the right to accept the whole or any parts of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

Yours faithfully,

Encl: Specifications

**Registrar, IIT Palakkad**

## Make Your Own Machine Lab

This tender deals with acquisition, delivery, installation, commissioning and training of the following : DC and AC machines trainer kits for students to assemble their own machines along with related instrumentation and accessories as per the plans provided in this document.

### A.Details of Machines to be Procured

1. No. of kits - 2
2. Each set should have the following equipment:
  - a) Trainer kit containing all the parts of DC and AC rotating machines along with fixtures and base plates used for fixing the machines to the bench
  - b) Power supply unit
  - c) Measurement unit for voltage, current and speed measurement
  - d) Load and rheostat module
  - e) Electromagnetic Brake
  - f) Synchronization Board
3. The output power level of each of the assembled dc or ac machine should be in the range of 100-250 W.
4. The following machines should be built from the trainer kit
  - a) Shunt, series and compound excited dc motor
  - b) Shunt, series and compound excited dc generator
  - c) Induction motors: three-phase wound and squirrel cage, single-phase repulsion and with capacitor
  - d) Synchronous motor and synchronous alternator
5. Safety precautions:
  - a) The kit must be designed with a protective plexiglass/acrylic shield to protect the user from any inadvertently loose parts.
  - b) Power supply must have adequate safeguards that shuts off the supply in case of any short circuit/ fault/ overloading / overspeed operation of machine. The maximum speed limit must be restricted to 4000 rpm

### B. Who can Participate?

Only those bidders fulfilling the following criteria should respond to the tender.

1. Bidder should be either an **Original Equipment Manufacturer (OEM)** of Electrical Machines/allied systems OR an authorized dealer having purchase and support agreement with such an OEM.
2. The bidder should be a company registered under the Companies Act, 1956/2013 OR a Limited Liability Partnership (LLP) OR a registered partnership firm OR a sole proprietorship entity. Appropriate Registration/ incorporation certificate to be submitted. **Bidder must have a registered office in Karnataka/Tamil Nadu/ Telangana/Andhra Pradesh/Maharashtra, or Kerala. Certificate of registration for the offices to be provided.**
3. Bidder must also have a service center in Karnataka/Tamil Nadu/Telangana/Andhra Pradesh/Maharashtra, or Kerala. Certificate of registration for the centers to be provided.

4. Bidder must be in existence in the business of supply/manufacture of electrical machines/allied systems for a minimum period of 3 previous financial years (i.e., before or since 01-April-2014). Documentary evidence of experience must be provided.

5. The bidder should have implemented orders of electrical machines/allied systems worth exceeding INR 10 lakhs during previous two financial years (April 1, 2015 – March 31, 2017). Purchase orders and certificates of successful implementation must be included. Copies of financial statements or evidence of turnover must be furnished. IIT Palakkad reserves the right to determine if the field is allied or not and its decision will be final.

6. The bidder should provide documentary evidence of having supplied and installed electrical machines/allied systems at a Centrally Funded Technical Institution (like IIT, NIT, IISc). Bidder must provide a certificate of satisfactory performance of the installed setup. Contact details of faculty-in-charge of installed setup must also be provided.

**7. Compliance sheet for the specification & OEM Brochure has to be attached along with Technical bid. Vendor has to fill the compliance sheet and mention page number or reference number in OEM brochure. Unfilled / partial filled sheets lead to disqualification.**

**C. Detailed Specifications**

**No. of kits - 2**

**1. The assembling kit should atleast include the following components:**

AC Stator, squirrel cage rotor, wound rotor, DC stator, DC rotor with commutator, electronic speed transducer, brush holder with two brushes, brush holder with six brushes. The machines assembled using parts of the trainer kit will be rated as below.

**a) DC Machine**

i) Power rating	100-250 W
ii) Armature voltage	30-50 V
iii) Field current	Less than 1 A
iv) Type	Both separately and shunt excited
v) Number of poles	2-main pole, 2-Inter pole
vi) Speed	2500-3000 RPM
vii) The DC stator and rotor connections must be brought out to the terminal board	

**b) AC Synchronous Machine**

i) Output power rating	100-250 W
ii) Voltage	30.50 (line to line voltage)
iii) Type	cylindrical rotor

iv) Field current	Less than 10 A
v) Frequency	50 Hz
vi) Speed	3000 RPM
vii) Number of phases	3 phase
viii) The AC stator and rotor connections must be brought out to the terminal board so that the machine can be star or delta connected.	

**c) 3-Phase Induction Motor**

i) Power rating	100-250 W
ii) Rotor type	Both squirrel cage and wound
iii) Stator Voltage	30-50 V (Line to line voltage)
iv) Number of Phases	3
v) Number of poles	2 or 4
vi) Frequency	50 Hz
vii) The AC stator connections must be brought out to the terminal board so that the machine can be star or delta connected.	

**d) Single Phase Induction Motor**

<b>Induction Machines</b>	
i) Power rating	100-250 W
ii) Stator Voltage	30-50 V single phase
iii) Number of Phases	1
iv) Number of poles	2 or 4
v) Capacitor	Appropriate capacitance in the 50-100 uF range to run machine as a single phase induction machine
vi) Frequency	50 Hz
vii) The AC stator connections must be brought out to the terminal board so that the machine can be star or delta connected.	

## 2. Power Supply Modules

Component Details	Specification
Input power	3-phase 380-415 V power from mains
AC fixed output three-phase	Voltage and current ratings as required for the above set of machines
AC variable output single phase	Variable voltage to deliver power from 0 to atleast 100 VA
DC fixed output	Voltage and current ratings as required for the above set of machines
DC variable output	Variable voltage to deliver power from 0 to atleast 100 W

## 3. Electrical and Speed Measurement Module

Measurement Module Components	Quantity	Measurement Range
DC, AC ammeter and display	2	0-19.99 A
DC, AC voltmeter and display	2	0-99 V
Speed measurement and display	1	0-4000 rpm

## 4. Loads and Rheostat Module

This module should have rheostats and capacitors which shall be used for resistive and capacitive loading of the generators. These loads shall be used as starting rheostat both for the three-phase asynchronous motors with wound rotor and for the direct current motors and as starting and running capacitors for the induction single phase motor.

Rheostats and Capacitors	Quantity	Ratings
Fixed Load Resistances	3	15 $\Omega$ / atleast 80 W
Fixed load resistance	1	1 $\Omega$ / atleast 80 W
Variable load resistance	1	0-2 $\Omega$ / atleast 80 W
Excitation Rheostat (variable)	1	0 to 80 $\Omega$ (maximum current 1 A)
Capacitive load (Fixed Capacitors)	3	Appropriate capacitance in the 50-100 uF range to run single phase induction machine

## 5. Electromagnetic Brake

- a) Brake for testing motors with power up to 300W.
- b) Max. speed : 4000 rpm

- c) Power supply has to be taken from power supply module listed
- d) Any additional fixtures to couple electromagnetic brake with the machine under test need to be provided

## **6. Synchronization Board**

Rotating light synchronoscope provided with fuses and switch to perform the parallel connection between generators or between the alternator and the mains.

## **7. Additional Requirements**

The bidder should ensure that the electrical machines should be covered by warranty of at least 3 years. Appropriate number of spares for components used in the electrical machines must be supplied by vendor to service the electrical machines within 3 working days.

## **8. Supply, Installation and Commissioning**

The transportation, unloading, unpacking, installation and commissioning of the trainer kits will be done by the vendor. Two IIT Palakkad engineers will be trained by the vendor for a period of two days for maintenance and service of the trainer kits during installation.