

TENDER NOTICE

Sealed Bids are invited from GST registered firms/authorized Dealers/manufacturers for supply of Lab Equipment for following Labs of Department of Mechanical Engineering, FET (Male) International Islamic University, Islamabad:

S. #	Name of Labs/Department/Faculty	Document Fee
1	i) LAB EQUIPMENT FOR FLUID LAB ii) LAB EQUIPMENT FOR THERMO/HVAC/HMT/MMT LAB	Rs.1000/-(non-refundable) (Detail of items/ Specifications are mentioned in the tender documents)

2. Tender documents can be downloaded from **www.ppra.org.pk** and **www.iiu.edu.pk**.
3. Tender fee i. e. Rs.1000/- (Non-refundable) will be deposited along-with bid/tender in shape of Call Deposit/Bank Draft in favor of IIUI.
4. Tenders valid for a period of 04 months on F.O.R basis along-with earnest money @2% (refundable) of total bid in the shape of Call Deposit/Bank Draft in the name of International Islamic University, Islamabad, must reach in the Office of undersigned on or before **Tender Closing Date i. e. 23-12-2014 up-till 10:30 A. M. which will be opened on the same date at 11:00 A. M.** in presence of the bidders/their representatives who may like to attend the opening ceremony.
5. The University reserves the right to accept or reject any/all bid(s)/tender(s) in terms of Section-33 of Public Procurement Rules, 2004.

Javaid Rabbani, Assistant Director (P&S), Room # 213, (2nd Floor) Administration Block,
Sector H-10 International Islamic University, Islamabad, Phone # 9019255



INTERNATIONAL ISLAMIC UNIVERSITY, ISLAMABAD

No.17/11/2014/P&S-

Dated: _____.

M/S _____

**Subject: Procurement of Lab Equipment for FLUID and THERMO/HVAC/HMT/MMT Labs of
Department of Mechanical Engineering, FET (Male)**

Dear Sir,

We are pleased to invite your sealed tender(s) for the items mentioned at Annex I & II. The terms & conditions of the tender/supplies are given below:

A) SUBMISSION OF TENDER

1. You are required to send your tenders addressed to Assistant Director, (P&S), International Islamic University Islamabad latest by **23-12-2014 till 10:30A. M.** You may send your tenders through registered A/D mail addressed to Assistant Director-II, (P&S), Room No. 213, 2nd Floor, Admin Block, New Campus, Sector H-10, International Islamic University Islamabad, which must reach before the closing date and time mentioned above. Tenders **will be opened at 11:00 A. M.** on the same day in the presence of tenderers.
2. Tenders receive after stipulated date & time shall not be considered. International Islamic University Islamabad will not be responsible for postal delays. The decision of Addl. Director (P&S) International Islamic University Islamabad in this respect shall be final and binding.
3. Bidders are required to submit a Pay Order of Rs.1000/- (Rupees one thousand only) as tender fees (non-refundable) along with Technical Proposal.

B) EARNEST MONEY

The Tender should be accompanied by a Pay Order payable (valid for 04 months from the date of tender opening) equivalent to 2% of total value in the name of INTERNATIONAL ISLAMIC UNIVERSITY, ISLAMABAD as interest free Earnest Money (Refundable) with financial proposal. Earnest Money in any other shape shall not be accepted. Earnest / Security Money deposited against a running contract (s) purchase orders(s) shall not be transferable as earnest money for any other tender. **Tenders without Earnest Money shall not be considered.**

C) RETENTION MONEY

For successful bidder(s) 05% of total value of every Purchase/Supply Order will be Retained/Held till the completion of Warranty Period of the items and Earnest Money will also be retained by the IIU up-till the completion of the Supplies.

PREPARATION OF TENDER

"Single Stage Two Envelope Basis"

- The BID (Tender) submitted shall comprise of a single package containing two envelopes, each envelope shall be marked and will contain "FINANCIAL" and "TECHNICAL" proposal.
- On the given tender opening date only "Technical Proposal" will be opened in the presence of tenderers available.
- The "Financial Proposal" shall be shown to the parties but will be retained with IIU without being opened.
- After Technical Evaluation of the received Technical Proposals, Financial Proposals will be opened publicly at the date, time & venue to be announced and will be communicated to the bidders in advance.
- IIU will open the "Financial Proposals" publicly of the parties whose Technical Proposals have been found acceptable.
- Financial Proposals of the technically non-responsive bids shall be returned **un-opened** to the respective bidders.

E) PREPARATION OF TENDER – TECHNICAL PROPOSAL:

IIUI's requirements with Technical Specifications are given.

Bidders MUST:

- Be OEM or Authorized Partner/ Reseller/Dealer.
- Be registered with Sales Tax Authorities. (Please attach copy of Registration Certificate).
- Quote Rates, GST, and other taxes separately.
- Bid on Prescribed Performa issued by IIUI. **No letter head, photocopy will be accepted.**
- Affix the company seal on all tender documents.
- Mention clearly Tender Reference on **TOP RIGHT CORNER OF PROPERLY SEALED ENVELOPE, BEARING COMPANY'S STAMP.**

Please give all the available technical details of the items offered by you, supported with the technical literature, brochure, drawings and pictures, client list details, **warranty**, authorization certificates, etc.

Bids / Tenders / Technical Proposal received shall be evaluated in accordance with the given technical specifications.

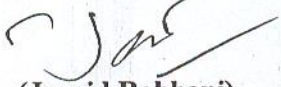
F) PREPARATION OF TENDER – FINANCIAL PROPOSAL

The tenders should be enclosed in double cover. The inner cover should be sealed having enclosed the following documents:

- Annex-I & II duly filled in, signed and sealed.
- Original Pay Order for Earnest Money.
- The outer cover should bear address of the **Assistant Director-II, (P&S), Room No. 213, 2nd Floor, Admin Block, New Campus, Sector H-10, International Islamic University Islamabad** and reference number of the tender with opening date of tender.
- All information about the material proposed to be supplied must be given as required in the Annex-I & II to tender.

G) PRICES

- a) The prices mentioned in the tender will be treated as firm till the completion of Purchase Order / Contract.
- b) The Prices must be stated both in words and figures. Additional information, if any must be linked with entries on the Annex-I & II to Tender.
- c) Offers must be valid for 04 months.
- d) Payment will be made on submission of bill, with delivery challan, GST Invoice and Warranty Card after satisfactory completion of the supply order, installation testing and commissioning.
- e) The University reserves the right to reject all bids in terms of Section-33 of Public Procurement Rules, 2004.


(Javaid Rabbani)
Assistant Director-II (P&S)
051-9019255

LIST OF EQUIPMENT WITH SPECIFICATIONS

LAB EQUIPMENT FOR FLUID LAB				
S.#	Name of Equipment & Technical Specifications	Qty.	Unit Price Inclusive of GST	Total Amount (Rs.)
1	<p><u>Basic Hydraulic Bench:</u></p> <ul style="list-style-type: none"> • Stainless structure. • Screws, nuts, plates and all the metallic elements in stainless steel. • Diagram in the front panel with similar distribution to the elements in the real unit. <p>Quick connections for adaptation to feed hydraulics source.</p> <ul style="list-style-type: none"> • Centrifugal pump: 0.37 KW, 30-80 l./min at 20.1-12.8m., single-phase 220V./50Hz. or 110V./60Hz. • Stainless steel impeller. • Tank capacity: 140 l. approx. • Flow meter. • Membrane type flow adjusting valve. • Safety switch ON/OFF. • Supports for accommodating the test module. • This unit incorporates wheels for its mobility. <p>Dimensions: 1000 x 600 x 700 mm. approx. Weight: 40 Kg. approx.</p>			
2	<p><u>Reciprocating Pump Test Rig :</u></p> <p>Maximum capacity: 1.5m³/h Maximum head: 60m WC max. motor speed: 3000rpm Intake connection diameter 1" Delivery connection diameter 1" Dimensions and Weight lxwxh : 690 x 500 x 410 mm Weight : approx. 24 kg Scope of Delivery 1 reciprocating pump, fitted to base plate complete with connections and sensors [1] Reciprocating pump for operation on the HM 365.10 Basic Module Water Pumps [2] Pump complete with connections and sensors fitted to base plate [3] Max. capacity 1.5m³/h [4] Max. head 60m WC</p>			

Kaplan Turbine Apparatus:

Kaplan turbine

- max. output: 1000W
- max. speed: 3700min-1
- control wheel
- 8 guide vanes, adjustable: -15° ... 45°
- external diameter: 120mm, internal diameter: 60mm
- impeller, 4 vanes, fixed
- external diameter: 120mm, internal diameter: 60mm, pitch: 80mm

Submersible pump with motor

- max. flow rate: 250m³/h
- max. pump head: 11m
- nominal power: 3,1kW

Tank: approx. 350L

Measuring ranges

- temperature: 0...100°C
- pressure (at turbine inlet): 0...1bar rel.
- pressure (at turbine outlet): -1...0,6bar rel.
- flow rate: 13...200m³/h
- torque: 0...10Nm
- speed: 0...6500min-1

Dimensions and Weight

LxWxH: 1450x1250x1650mm

Weight: approx. 430kg

Required for Operation

400V, 50Hz, 3 phases

4

Non-Contact Tachometer:

Specifications

Display: 5-digit alphanumeric LCD

Range:

Optical: 5 to 200,000 rpm

Contact*: 0.5 to 20,000 rpm

(Other ranges: inches, feet, yards, miles, cm, m, per hour, minutes, seconds)

Accuracy:

Optical: $\pm 0.01\%$ of reading

Contact*: $\pm 0.05\%$ of reading (rpm)

Resolution: 0.001 to 10 rpm

(speed range dependent)

Operating Range: 50 mm to 7.6 m
(2" to 25')

Memory: Max, min and last

Power: 2 "AA" 1.5 Vdc
batteries (included)

Environmental: 5 to 40°C

(41 to 104°F), 80% RH up to
30°C (86°F)

Dimensions:

176 x 61 x 41 mm

(6.9 x 2.4 x 1.6")

Weight:

210 g (7 oz)

Francis Turbine Apparatus:

- [1] investigation of a Francis turbine
- [2] closed water circuit with pump, motor, flow control valve and tank with cooling circuit
- [3] three-phase motor for pump with variable speed via frequency converter
- [4] adjustment of flow rate via flow control valve
- [5] loading the turbine by use of the DC generator
- [6] impeller and control device of the turbine completely visible
- [7] adjustable guide vanes for setting different angles of attack
- [8] non-contact speed measurement at the motor shaft and force sensor for measuring the driving torque
- [9] digital display for temperature, flow rate and pressures (additional manometer within scope of supply), speed and torque
- [10] GUNT software for data acquisition via USB under Windows Vista or Windows 7

Francis turbine

- P hydraulic: 2,1kW at 1500min-1
- P mechanical: approx. 1,4kW at 1500min-1
- impeller, external diameter: 120mm, 15 vanes
- 10 guide vanes

Centrifugal pump, multistage

- electric output: 5,5kW
- max. flow rate 960L/min
- pump head 45m

Drive motor with frequency converter

- speed: 500...3000min-1

DC generator

- as brake: 1,5kW at 1500min-1
- speed: 500...2500min-1

Tank: 550L

Measuring ranges

- temperature: 0...100°C
- pressure (at turbine inlet): -1...1bar
- pressure (at turbine outlet): 0...6bar
- flow rate 0..3000L/min
- torque: 0...20Nm
- speed: 0...9999min-1

Dimensions and Weight

LxWxH: 2350x1050x2050mm

Weight: approx. 370kg

Required for Operation

400V, 50Hz, 3 phases

LIST OF EQUIPMENT WITH SPECIFICATIONS

LAB EQUIPMENT FOR THERMO/HVAC/HMT/MMT LAB				
S.#	Name of Equipment & Technical Specifications	Qty.	Unit Price Inclusive of GST	Total Amount (Rs.)
1	<u>4 Stroke 4 Cylinder Actual Petrol Cut Section Engine Model:</u> <ul style="list-style-type: none"> • Specifications: • 4 in-line cylinders • Displacement: 2000 cu. Cm • DOHC twin overhead camshaft • Multipoint electronic injection with ignition-integrated control unit • Vibration-damping balancing shafts • Gearbox 5 forward speeds + reverse • 4 valves per cylinder • Water cooling • 12 Volt alternator • Membrane spring clutch • The engine operates electrically at 220 volts and runs at a reduced speed to let the student easily understand and observe the operation of the various mechanical parts. • Approx. weight and dim.: • Cm: 160x86x100h • Net Weight: kg 195 • Gross Weight: kg 250 			
2	<u>Diesel Engine Cut Section Model:</u> <ul style="list-style-type: none"> • 4 stroke engine; 4 in-line cylinders • Displacement: 2500 cu. cm • Direct/indirect injection • Feeding by turbo-supercharger; • VE Bosch type rotary injection pump • Overhead camshaft (OHC) • Distribution through a toothed belt; • Alternator • Thermostatic valve • Intercooler water-oil • Water cooling • Approx. weight and dim.: • Cm: 90x100x120h • Net Weight: kg 200 • Gross Weight: kg 260 • The engine operates electrically at 220 volts and runs at a reduced speed to let the student easily understand and observe the operation of the various mechanical parts. 			

Gas Turbine with Power & Turbine:

- Using this unit, the operation of a two shaft gas turbine system for electric generation can be study and
- investigate.
- Anodized aluminum and steel structure and panels in painted steel.
- Main metallic elements in stainless steel.
- Diagram in the front panel with similar distribution to the elements in the real unit.
- High Pressure Turbine, that it is the Gas Generative Turbine. It consists of:
 - Radial compressor.
 - Tubular type combustion chamber.
 - Expansion turbine.
- Speed range: 60,000-120,000 rpm.
- Max. compression ratio: 2:1.
- Max. fuel consumption: 20 kg/hour.
- Low Pressure Turbine (Power Turbine):
 - Speed range (r. p. m.): 15,000-25,000 rpm.
 - Electrical power: Measurement range: 0-1,500W.
- Asynchronous (motor) generator, computer controlled; speed range:
 - 1,500-3,000 rpm.
- Power turbine connection and generator by means of adjustable
 - belt-drive.
- Start fan, driven by an electrical motor, for starting the turbine and
 - gas sweep. This fan is computer controlled.
- Aspiration muffler.
- Line of fuel gas, consists of:
 - Valve to open or to close the feeding.
 - Pressure regulation valve.
- Flow meter (rotameter): 20-80 l./min.
- Electrovalve (solenoid), computer controlled.
- Gas injector.
- Ignition electrode, computer controlled, feeded by an ignition transformer.
- Ionization electrode, computer controlled, to detect that the flame is ignited, as security system.
- Lubrication installation, consists of:
 - Oil tank of 5 liters.
 - Gear pump, computer controlled, to impulse the oil to the bearings of both turbine shafts.
 - Filtration unit.
 - 2 valves for regulating the oil feed to the turbine.
 - Plate heat exchanger for cooling the oil of the turbines.
 - Water supply connections.
 - Air filter.
 - Exhaust gas outlet and exhaust muffler.
- Sensors and instrumentation:
 - 8 Temperature sensors, "K" type, placed in the different process stages (temperature range: 0-1,100°C):

- Temperature of the inlet air to the compressor.
- Temperature of the inlet air to the combustion chamber.
- Temperature of the inlet gases to the gas generative turbine.
- Temperature of the inlet gases to power turbine.
- Temperature of the exhaust gases.
- Temperature of the bearing lubrication oil.
- Temperature of the inlet refrigeration water.
- Temperature of the outlet refrigeration water.
- 2 Speed sensors to measure the rpm of each turbine, measurement range: 0-200,000 rpm.
- 5 Pressure sensors, for measuring:
- Fuel (propane gas) pressure at the combustion chamber inlet, range: 0-2 bar.
- Pressure in the combustion chamber, range: 0-2 bar.
- Compression of the gas generative turbine, range: 0-2 bar.
- Pressure at the power turbine inlet, range: 0-2 bar.
- Atmospheric pressure, range: 900-1,200 mbar.
- 2 Flow sensors:
- 3 Inlet air, range: 0-3,000 m /h.
- 3 Outlet gases, range: 0-3,000 m /h.
- 4 Manometers, range: 0-2 bar.
- 3 High pressure switches.
- ATEX flowmeter for measuring the gas consumption.
- Current and voltage measurement.
- Handling box with PLC, which includes:
- Front panel with LEDs indicating the unit status.
- Oil temperature control display.
- Safety system to prevent faults.
- Operation with propane.
- This unit incorporates wheels for its mobility.

4

Two Stage Compressor Trainer:

Compressor

- two-stage
- with 2 cylinders in a V-arrangement
- power consumption: 3kW
- speed: 710min-1
- intake capacity: 250L/min
- quantity delivered: 202L/min (at 12bar)
- operating pressure: 12bar, max. 35bar

Priming tank: 20L

Pressure vessels, 16bar; capacity:

- after 1st stage: 5L
- after 2nd stage: 20L

Safety valve: 16bar

Measuring ranges

- differential pressure: 0...25mbar
- pressure: 1x 0...1,5bar / 2x 0...16bar
- temperature: 4x 0...200°C
- power: 0...3500W

	<p><u>Two Cylinder Steam Engine:</u></p> <p>Compressor</p> <ul style="list-style-type: none"> - two-stage - with 2 cylinders in a V-arrangement - power consumption: 3kW - speed: 710min⁻¹ - intake capacity: 250L/min - quantity delivered: 202L/min (at 12bar) - operating pressure: 12bar, max. 35bar <p>Priming tank: 20L</p> <p>Pressure vessels, 16bar; capacity:</p> <ul style="list-style-type: none"> - after 1st stage: 5L - after 2nd stage: 20L <p>Safety valve: 16bar</p> <p>Measuring ranges</p> <ul style="list-style-type: none"> - differential pressure: 0...25mbar - pressure: 1x 0...1,5bar / 2x 0...16bar - temperature: 4x 0...200°C - power: 0...3500W 			
6	<p><u>Compact Steam Turbine Plant:</u></p> <p>Two-cylinder piston steam engine</p> <ul style="list-style-type: none"> - speed: max. 1000min⁻¹ - max. continuous power: 500W - 2 cylinders bore: 50mm stroke: 40mm <p>Pump</p> <ul style="list-style-type: none"> - power consumption: max. 60W - max. flow rate: 2,9m³/h - max. head: 4m <p>Condenser</p> <ul style="list-style-type: none"> - transfer surface: 3800cm² <p>Measuring ranges</p> <ul style="list-style-type: none"> - temperature: 7x 0...400°C - pressure: 0...10bar / 0...1,6bar - speed: 0...1200min⁻¹ - cooling water flow rate: 100...1000L/h <p>Dimensions and Weight</p> <p>LxWxH: 950x800x1760mm</p> <p>Weight: approx. 150kg</p> <p>Required for Operation</p> <p>230V, 50/60Hz, 1 phase</p> <p>Water connection, drain, steam via ET 813.01</p>			
7	<p><u>Universal Truss Apparatus:</u></p> <p>Truss with 19 PVC bars</p> <ul style="list-style-type: none"> - height of truss max. 450mm - length of truss max. 900mm - bar lengths 2x 150mm 5x 259mm 7x 300mm 			

	1x 397mm 3x 424mm 1x 520mm - angle between bars: 30°, 45°, 60°, 90° - maximum bar force: 200N Load application device - measuring range: -500...+500N, graduations: 10N Dial gauge - measuring range: 0...0,10mm, graduations: 0,01mm			
8	<u>Behavior of rubber shearing Apparatus:</u> hear body: natural rubber, 40shore(A) Modulus of shear: approx. 0.42N/mm Dial gauge: 0...10mm, graduations 0.01mm			
9	<u>Wind Tunnel:</u> [1] Open wind tunnel on mobile carriage [2] Experimental set-up lxwxh 2890x860x1670mm, 250kg [3] 450mm Plexiglas measurement section, cross-section of flow 292x292mm [4] Inlet hopper, nozzle and diffuser made of FRP [5] Speed-controlled fan motor with frequency converter [6] Electron. 2-components force transducer with measuring amplifier and digital display [7] Flow rectifier Technical Data measurement section Cross-section wxh: 292x292mm Length: 450mm Max. wind velocity: 28m/s Fan Pressure difference: 500Pa Max. volumetric flow: 9000m³/h Motor output: 2.25kW Max. rotational speed: 2850rpm 2-component force transducer Measuring range: 0...5N and 0...10N Slanted tube manometer 0...500Pa Dimensions and Weight lxwxh : 2890 x 860 x 1670 mm Weight : approx. 250 kg Connections 230V, ~50Hz			
Total Amount				
Amount of Earnest Money				

In Words: (Rupees _____)

Attention:-

Non compliance to the conditions mentioned below at Serial No. 1 to 5 will render the quotation for rejection at the time of opening of tenders.

Board Terms and Conditions of Tenders:-

1. Rates must be quoted in words and figures both as per accounting unit inclusive of all taxes, (FOR Basis) and free delivery at Central Store of IIUI, at New Campus, Sector H-10, Islamabad.
2. Offer must be firm and final and valid for 04 months.
3. Incomplete, mutilated offer or offers without/ deficient earnest money are liable for rejection.
4. Copy of certificate of registration with Sales Tax collectorate must accompany the quotation.
5. IIUI will be the sole judge to determine the quality and the workmanship of the above item and also have the right to visit the facility / premises of the tenderer or call for any further documents to establish the capability of firms to undertake this order / contract. IIUI's decision in this regards shall be final will not be questioned in any court.

We / I hereby confirmed having read and understood the terms and conditions of the tender and we / I expressly confirm and agree that our tender for the supply of above mentioned items are in accordance with the terms & conditions of Tender Documents.

TENDERER'S SIGNATURE_____

DESIGNATION_____

ADDRESS_____

Tel No._____ Fax No._____ Email_____

GST No._____

NTN No._____

SEAL:_____