

# **Tender Document**

**Supply of Lab Equipment for Physics Department**



**COMSATS University Islamabad  
Park Road, Islamabad**

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## 1. Tender Notice

### COMSATS University Islamabad CUI-Proc/(TN-460)/03/2024.

## Supply of Lab Equipment for Physics Department

1. COMSATS University Islamabad (CUI), a Public Sector University invites Bids through e-Pak Acquisition & Disposal System (EPADS) <https://eprocure.gov.pk> on “**Single-Stage Two-Envelope**” method from Income Tax & GST registered Firms/Companies who are on the Active Taxpayer List (ATL) for General Sales Tax and Income Tax of FBR for **Supply of Lab Equipment for Physics Department**.
2. The Bid Security for the Bid is **Rs.400,000/-** in the form of Call Deposit/Bank Draft (refundable) drawn in favor of “COMSATS University Islamabad” (FTN/NTN: 9013701-9); scanned copy of which is required to be uploaded through EPADS and hard copy must be submitted physically along with hard-copy of sealed bidding document on the closing date of the tender to COMSATS University Islamabad on the address given below.
3. The complete Tendering process shall be carried out through EPADS.
4. Interested bidders are requested to register themselves on the EPADS <https://eprocure.gov.pk/#/supplier/registration> and submit their tender documents.
5. For registration and guidance/training on EPADS, you may contact EPADS UAN: 051-111-137-237.
6. Closing date of submission is **March 26, 2024, by 1100 hours**. The bids shall be opened **half hour after the closing time** in the presence of the bidders who wish to be present, in Room No. G-6/G-8, Ground Floor, Faculty Block-I, COMSATS University Islamabad.
7. As per PPRA Rule 33, CUI may reject all bids or proposals at any time prior to the acceptance of a bid or proposal.

### Contact Person and Submission



In-Charge Procurement  
**COMSATS University Islamabad**  
2nd Floor, Faculty Block-II, Park Road, Tarlai Kalan, Islamabad,  
Tel: 0336-5524334, 051-90495242, 051-9049-5154, 051-9049-5122  
Email: wajidkamra@comsats.edu.pk

## 2. Key Points

**Table # 1**

S.N	Detail	Specification
1.	Validity of Bid	90 Days from the date of closing of Bids
2.	Award of Contract / W.O	Item-wise Basis
3.	Delivery Time	30 Days from the date of issuance of W.O
4.	Method	Single Stage Two Envelopes
5.	Closing Date & Time	March12,2024 by 1100 hours
6.	Opening Date & Time	March12,2024. Half Hour after the Closing Time on the same day
7.	Bid Security Amount (Under Rule 25 of PPRA Rules 2004)	Rs.400,000/-
8.	Performance Guarantee (Under Rule 39 of PPRA Rules 2004)	10% of the Invoice Cost for ONE YEAR

## 3. General Terms & Conditions of the Tender

- i. No tender/bid shall be considered if: -
- Not uploaded through EPADS;
  - Received without required documentation or deficiency in required documentation;
  - Received without bid security;
  - In contradiction with the specification given by the CUI;
  - Received with any condition;
  - The bidder is in litigation with CUI or is blacklisted by any organization or is notified as blacklisted on PPRA website.

## 4. Contact person and Submission of Bids:

- i. Contact Person for all inquiries, clarifications and bid submission shall be:

In-Charge Procurement  
COMSATS University Islamabad  
2nd Floor, Faculty Block-II, Park Road, Tarlai Kalan, Islamabad,  
Tel: 0336-5524334, 051-90495242, 051-9049-5154, 051-9049-5122  
Email: wajidkamran@comsats.edu.pk

## 5. Validity of Bids:

- The Bid shall remain valid as mentioned in **Table 1** of the tender document.
- Any bidder/firm/ company which refuses to accept the Work Order based on market price escalation shall result in forfeiting the bid security. CUI may also impose a ban from business with it for a period of 6 months.

## 6. Price of the Bid:

- i. Prices quoted by the Bidder shall be fixed during the period of the contract and not subject to variation on any account.
- ii. Applicable Income tax and GST shall be deducted at source and as per rules. In case of exemption, please mention and attach proper documentation duly verified from the concerned tax authorities. However, CUI may accept the exemption certificate. In case of non-acceptance, CUI shall deduct all applicable taxes as per tax rate. CUI shall provide a certificate of tax deduction and the vendor may claim refunds from Tax Authorities/FBR.
- iii. In the case of tie in rates of the bidders, award of contract shall be decided through balloting in the presence of the of the bidders.
- iv. Unit price shall be taken up to 1 decimal point. The total cost shall be round-up to zero decimal.
- v. In case of any conflict in the price/cost quoted by the bidder, the unit cost (Exclusive of GST) quoted by the bidder shall be considered for calculation.
- vi. In case GST is not mentioned, the prices shall be considered as inclusive of GST.

## 7. Bid Currencies & Bid Security:

- i. Bid prices shall be quoted in Pak Rupees.
- ii. The currency of the bid security shall also be in Pak Rupees.
- iii. The Bidder shall furnish, as part of its bid, bid security as specified in **Table 1** of the tender document. The bid security is required to protect CUI against the risk of Bidder's default which would warrant the security's forfeiture.
- iv. The bid security shall be in favor of **COMSATS University Islamabad (FTN/NTN: 9013701-9)**, in any of the following form:
  - a. Bank Draft
  - b. Pay Order
- v. A scanned copy of bid security is required to be uploaded through EPADS and hard copy must be submitted physically on the closing date of the tender to COMSATS University Islamabad on the address given in the tender notice.
- vi. No personal cheques shall be acceptable at any cost. Also, any previous bid security shall not be considered or carried forward.
- vii. The bid security found deficient of the required amount shall not be considered.
- viii. Unsuccessful bidders' bid security shall be released and returned promptly as the successful bidder gives consent to the work order or signs the contract agreement, whichever is applicable.
- ix. The bid security of the bidder shall be forfeited if the bidder:
  - a. Requests for withdrawal of his bid during the evaluation process.

- b. Does not accept the correction of arithmetic errors in its bid.
- x. The bid security of the successful bidder shall be forfeited if the bidder:
  - a. Fails to accept the work order/sign the contract agreement after announced as successful Bidder.
  - b. Fails to comply with the requirement of the bid and contract.

## **8. Clarification of Bidding Document:**

- i. During evaluation of the bid(s), CUI may, at its discretion, ask the Bidder for a clarification of its bid and such information imperative for evaluation. The request for clarification and the response shall be in writing, and no change in the prices or substance of the bid shall be sought, offered, or permitted. In case the bidder fails to respond within given deadline, the bidder shall be considered as non-responsive and shall be disqualified from the bidding process.

## **9. Opening of Bids:**

- i. CUI shall open all bids through EPADS at the time, date, and place specified in tender notice, in presence of bidders' representatives who wish to attend the meeting and shall sign an attendance sheet as evidence of their presence.

## **10. Influencing the evaluation process:**

- i. No Bidder shall contact CUI on any matter relating to evaluation of its bid, from the time of bid opening to the time evaluation report is made public. If the Bidder wishes to bring additional information or has a grievance to submit, it should do so through EPADS.
- ii. Any effort by a Bidder to influence CUI during bid evaluation may result in disqualification of the bid.

## **11. Qualification & Evaluation of Bids:**

- i. CUI shall determine whether the Bidder is qualified to perform the Contract satisfactorily, in accordance with the criteria & qualification specified in the tender document.
- ii. The qualification shall be based upon an examination of the documentary evidence submitted by the Bidder, as well as such other information as CUI deem necessary and appropriate.
- iii. CUI shall technically evaluate and compare the bids which have been determined to be substantially responsive, as per evaluation criteria given in the tender document.
- iv. The bidder's financial evaluation of a bid shall be based on the lowest evaluated bid inclusive of all prevailing taxes and duties.
- v. CUI shall examine the bids as whether:
  - a. They are complete in all respect;

- b. Any computational errors have been made;
  - c. Required financial sureties have been furnished;
  - d. The documents have been properly signed.
- vi. Arithmetical errors shall be rectified on the following basis:
- a. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price (exclusive of tax) shall prevail, and the total price shall be corrected. If the Contractor does not accept the correction of the errors, the bid shall be rejected, and the bid security shall be forfeited.
  - b. If there is a discrepancy between words and figures, the amount in words shall prevail.
- vii. CUI may waive any minor non-conformity, in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.
- a. *Explanation: A minor non-conformity is one that is merely a matter of form and not of substance. It also pertains to some immaterial deficiency in a Bid or variation of a bid from the exact requirements of the tender document that can be corrected or waived without being prejudicial to other bidders. The deficiency is immaterial when the affect on quantity, quality, or delivery is negligible when contrasted with the total cost or scope of the supplies or services being acquired. CUI shall either give the bidder an opportunity to correct any deficiency in a bid or waive the deficiency, whichever is advantageous to CUI.*
- viii. Prior to the detailed evaluation, CUI shall determine the substantial responsiveness of each bid to the bidding documents. For the purposes of these clauses, a substantially responsive bid is one which conforms to all the terms and conditions of the bidding documents without material deviations.
- ix. Deficiency in bid security, Applicable Law and Taxes and Duties shall be deemed to be a material deviation. The CUI 's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.
- x. If a bid is not substantially responsive, it shall be rejected and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

## **12. Notification of Evaluation Reports:**

- i. The evaluation report shall be notified through EPADS.

## **13. Corrupt or Fraudulent Practices & Blacklisting:**

- i. The bidders shall be required to observe the highest standard of ethics during the procurement and execution of contracts. For the purpose of this provision, the terms set forth below are defined as under:

- a. "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution;
  - b. "Fraudulent practice" means a misrepresentation of facts to influence a procurement process or the execution of a contract to the detriment of CUI;
  - c. "Collusive practice" is an arrangement among bidders (prior to or after bid submission) designed to establish bid prices at artificial, non-competitive levels for any wrongful gains, and to deprive CUI of the benefits of free and open competition.
- ii. CUI shall have the right to reject a proposal for award if it determines that the bidder had been engaged in corrupt or fraudulent practices in the past with any organization.
  - iii. Any bidder/firm/company which is blacklisted by any organization and/or notified as blacklisted by PPRA shall be considered disqualified from the bidding process unless and until it is de-notified on PPRA website.
  - iv. If it at any time, CUI determines that the firm has engaged in corrupt, fraudulent, or collusive practices in competing for, or in executing the contract, it shall sanction/ban a bidder/firm/company, in accordance with prevailing Blacklisting procedures under Federal Public Procurement Rules.

#### **14. Right to Accept or Reject Bids:**

- i. Under PPRA Rule 33(1), CUI may reject bids or proposals at any time prior to the acceptance of a bid or proposal, without incurring any liability to the bidder(s).

#### **15. Award of Contract:**

- iii. After scrutiny of all bidding documents, the final evaluation report shall be uploaded to EPADS, and the work order/purchase order shall be issued on the basis of most advantageous bid as mentioned in **Table 1** of the tender document.
- ii. The successful bidder shall immediately sign a contract agreement / give consent to the Work Order/Purchase Order. The bidder shall bear all the stamp duties and expenses for the purpose of contract agreement/Work Order/Purchase Order, if any.

#### **16. Notification of Award:**

- i. The notification of award shall constitute the formation of the Agreement/Work Order/Purchase Order.
- ii. Upon the successful bidder's signing the contract agreement/acceptance/consent to the Work Order/Purchase Order, CUI will promptly notify the unsuccessful bidder(s) and will release its bids security.

#### **17. Delivery Information:**

- i. The supply shall be made to CUI as mentioned in **Table 1** of the tender document.



- ii. In case of delay in delivery, the vendor may submit a written request for extension in delivery time, giving valid justification with proof.
- iii. CUI may extend the delivery time according to the reason of delay with the condition of deductions in percentage (0% to 10%) from the total bill as penalty. The decision shall be communicated to the vendor for extension along with [percentage of deduction, if any]. In case of non-responsiveness/non-acceptance by the vendor, the work order shall automatically be cancelled, the bid security shall be forfeited. CUI may also impose a ban from business with it for a period of six months.
- iv. CUI may reject the request for extension, in which case, the work order shall be cancelled, the bid security shall be forfeited. CUI may also impose a ban from business with CUI for a period of six months.
- v. It shall be the responsibility of vendor to make delivery as per Work Order directly to the **Store Section entry through Gate 1, behind Main Library Building. The Store (Mr. Waheed 051-9049-6035)** may be informed one day prior to delivery for proper arrangements and entry. The supplier shall insure the duly signed delivery challan from store officials.
- vi. The bills along with delivery challan (duly signed by authorized official of CUI) shall be submitted to the Procurement Office for further necessary payment process. Any deficiency in bill/supporting documentation shall be removed by the vendor.
- vii. Any defective item(s) shall be replaced by the vendor during the warranty period, free of cost, within one-week is time. In case of failure to supply the specific item, CUI shall purchase the item on risk and cost of the supplier, to be deducted from the bidder's bid security or performance guarantee.
- viii. Payment shall be made as per actual quantity delivered & accepted to CUI.
- ix. Samples are mandatory where specifically demanded and bid without samples shall be considered non-responsive. No sample(s) shall be accepted after the closing date of the tender. Sample(s) other than the demanded item(s) shall not be considered.
- x. After technical evaluation of bids, sample(s) provided by bidders may be picked up from the procurement section within 30 days from the date of technical bid evaluation announcement. Failure on the part of the bidder(s) to collect his samples within the stipulated time shall allow CUI to dispose-off the samples.

## **18. Legal Document**

- i. The Tender document and Contract agreement/Work Order/Purchase Order altogether shall have legal binding on all bidders.

## 19. Declaration Form

(THIS FORM IS TO BE PROVIDED WITH THE BID)

All the terms & conditions have been carefully read and understood and are hereby unconditionally accepted and it is declared that:

- a) I understand that by inserting any condition in my bid consciously or unconsciously shall automatically disqualify me from the bidding process.
- b) By altering/adding/deleting any point, clause, condition in the documents provided shall automatically disqualify me from the bidding process.
- c) All the information furnished by me here-in is correct.
- d) I have no objection if enquiries are made about the work listed by me/us in the accompanying sheets /annexure.
- e) I agree that the decision of CUI in selection shall be final and binding to me.
- f) I have read the instructions appended to the proforma and I understand that if any false information in the document is noticed at a later stage, CUI is at liberty to act in a manner in accordance with the applicable rules and terms & conditions of the tender, which may include Penalty AND/OR forfeiting of bid security AND/OR blacklisting for future tendering with CUI AND/OR bar from business with CUI for a period of six months.

<b>Tender Title</b>	
<b>Name of Firm/ Company</b>	
<b>Year of Establishment in this business</b>	
<b>Name of Authorized agent</b>	
<b>Office Address</b>	
<b>GST No.</b>	
<b>NTN.</b>	
<b>Valid Cell No.</b>	
<b>Valid E-mail (For all official correspondence)</b>	
<b>Signature &amp; Stamp</b> (Authorized Representative)	

## 20. Technical Evaluation Criteria:

**Table # 2: Mandatory Requirements:**

Detail	Criteria
1. Draft of Bid Security <i>(To be Physically Submitted to Purchase Section on the Closing Date)</i>	<b>Mandatory</b>
2. Financial Bid / Quotation (Strictly as per CUI pattern) <i>Any alteration/addition/deletion shall dis-qualify the bidder from the bidding process</i>	<b>Mandatory</b>
3. Declaration Form	<b>Mandatory</b>
4. Active Taxpayer List (ATL) of FBR Status as "Active" in I.T and Compliance Level is 100% in GST	<b>Mandatory</b>
5. <b>Proof of non-blacklisting:</b> Affidavit on legal paper of appropriate value (duly attested from notary public) OR letterhead that the firm/company is neither blacklisted nor in litigation with any public sector client	<b>Mandatory</b>
6. <b>Warranty</b> <b>As per Manufacturer Warranty of each item</b>	<b>Mandatory</b>
<b>Compliance with CUI requirement/Specification</b> 7. Mentioning of Brand Name (if any) is mandatory. Blank technical sheet shall be treated as non-compliance and may result rejection of tender / bid	<b>Mandatory</b>
<b>Professional Experience</b> 8. List of 5 executed/ similar contracts of over Rs.200,000/- each for <b>Different</b> <b>Clients</b> in the last 3 Year (10 Marks each)	<b>50 Marks</b>

- Failing in any of the mandatory requirement shall disqualify the bidder from the bidding process.
- To be qualified, securing at least 70% Marks in technical evaluation is Mandatory.
- After evaluation/marketing of bidders in technical evaluation process, financial bids of technically qualified bidders shall be only opened later on prior notice.
- **DO NOT attach any information or portfolio which is not requested. Only provide the demanded information**

## 21. FINANCIAL PROPOSAL

(On Company's Letterhead)

Ref No: \_\_\_\_\_  
 Date: \_\_\_\_\_

NTN: \_\_\_\_\_  
 GST: \_\_\_\_\_

### Supply of Lab Equipment for Physics Department

SN	Specification	Qty	Unit Price (GST Excl)	GST Amount (If any)	Unit Price (GST Incl)	Total Cost (GST Incl)
<b>REF: Requirement For MP Physics Lab Equipment (FT# 582784)</b>						
1	<b>UTP3305 II DC Power Supply equivalent or above</b> Regulated 0~32 V, 335 W	20				
2	<b>Digital Function Generator Uni-T UTG9010c (LCD Version), 10MHz equivalent or above</b>  Waveforms Sine, Square, Triangle, Ramp, Pulse, TTL etc. Amplitude Range (no load) from 1mVpp to 20Vpp Accuracy $\pm 5\%$ Resolution 0.1mV Frequency Range from 1Hz to 10MHz Accuracy $\pm 1\%$ Resolution 1mHz Output Power 2Wp-p Output Impedance 50Ω Attenuator 20dB + 40dB DC Offset from -10V to +10V Display Frequency: 4-digits-LED, Amplitude: 3-digits-LED Duty Cycle from 10% to 90% Distortion of Sine $\leq 2\%$ (at 1kHz) Rise time of Square $\leq 35\text{ns}$ VCF $\geq 100:1$ Frequency Counter Frequency Range from 0.2Hz to 10MHz Amplitude Range from 0.5Vp-p to 5Vp-p Input Impedance 10kΩ	20				

3	<p><b>ADT-7000 Analog/Digital Trainer Board equivalent or above</b></p> <p>Medium Sized Breadboard</p> <p><b>Adjustable DC power supply</b>, fix (+3.3V, -3.3V, +5V, -5V, +12V, -12V), regulated (0V – 15V)</p> <p><b>Analog Components:</b> resistors, capacitors, inductors, diodes, transistors (bipolar junction transistors and field-effect transistors), operational amplifiers (op-amps), and other passive and active components commonly used in analog circuits.</p> <p><b>Digital Components:</b> Logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR), flip-flops (RS, D, JK, T), counters, shift registers, multiplexers, demultiplexers, analog-to-digital converters (ADCs), digital-to-analog converters (DACs), and other digital building blocks.</p> <p><b>Input/Output Interfaces:</b> Interfaces for connecting external devices and sensors to the trainer board/kit, such as GPIO (General Purpose Input/Output) pins, analog input/output channels, and communication interfaces (e.g., UART, SPI, I2C).</p> <p><b>Expandability:</b> Ability to expand or interface with additional modules or expansion boards to extend the functionality of the trainer board/kit for more advanced experiments.</p> <p><b>Safety Features:</b> Built-in safety features such as overload protection, short circuit protection, and isolation to ensure the safety of students and equipment during experiments.</p> <p><b>Portability and Durability:</b> Portable and durable construction suitable for classroom use and student experimentation.</p>	20				
4	<p><b>UNI-T UTD2102CEX Digital Storage Oscilloscope equivalent or above</b></p> <p>Channels            2</p> <p>Bandwidth           100MHz</p> <p>Sample Rate        1GS/s</p> <p>Rise Time            <math>\leq 3.5\text{ns}</math></p> <p>Memory Depth      25kpts</p> <p>Waveform Acquisition Rate <math>\geq 2000\text{wfms/s}</math></p> <p>Vertical Sensitivity(V/div) 1mV/div~20V/div</p> <p>Time base Range(s/div) 2ns/div~50s/div</p> <p>Storage Setup, Wave &amp; Bitmap</p>	20				
<b>REF: Requirement For BS Physics Program (File # 581399)</b>						
5	<p><b>Thermal expansion apparatus equivalent or above</b></p> <p>One Base with built-in dial gauge and thermistor</p> <p>One Expansion tubes brass, copper and aluminum;</p> <p>16 mm dia. (80 cm length), Basic digital multimeter.</p>	2				

6	<p><b>Specific heat apparatus equivalent or above</b></p> <p>Specific Heat Set SE-6849(One Aluminum 1.25" d x 1.5" h  One Brass 3/4" d x 1.5"  One Stainless Steel 3/4" d x 1.44" h  One Zinc 3/4" d x 1.58" h  One Copper 0.625" d x 1.8" h)  PASPORT Temperature Sensor - PS-2125(One Stainless Steel Probe  Two 3" Tubing, Polyurethane) One Calorimetry Cup with Lid Heater Stirrer - PS-3401(One Support Rod)Ohaus Triple-Beam Balance (without Tare) - SE-8723 One Graduated Cylinder, 50 mL  One 1000-mL Beake Braided Physics String - SE-8050. Air Link capstone software, 550 and 850 universal interface for recording the measurements</p>	1				
7	<p><b>Heat engine cycle experiment equivalent or above</b></p> <p>One Heat Engine and Gas Law Apparatus includes (1x Heat Engine, one Air Chamber, one Rubber Stopper with hole, one Tubing with Quick-Connect Fittings, one Shut-Off Valveand one 200 g Mass)  One Large Rod Base includes (Sturdy cast iron base Leveling feet (distance between feet is 26 cm) with two separate mounting holes for rods (diameter of rods supported 6.3 mm to 12.7 mm (1/4 inch to 1/2 inch) and Special three-point contact design for securely mounting rods provide necessary leveling capabilities.  One Mass and Hanger Set includes (Four Mass hangers of 5.0 g with 3x 100 g mass (brass), 3x 50 g mass (brass), 6x 20 g mass (brass), 3x 10 g mass (aluminum), 3x 5.0 g mass (aluminum), 3x 2.0 g mass (plastic), 3x 1.0 g mass (plastic), 3x 0.5 g mass (plastic) and one Storage Case)  Two 3-Liter Plastic Tub (2 Pack)  1x Thread  Three Stainless Steel Rods (Diameter 0.5in, Length=45 cm, 90 cm and 120cm)  one PASPORT Rotary Motion Sensor with Three-step pulley (10, 29, and 48 mm in diameter) and Rod clamp. One PASPORT Quad Temperature Sensor includes (2x Two Stainless Steel Temperature Probes and Three Fast Response Probes)  1x PASPORT Dual Pressure Sensor which can Measure pressure in Heat Engine includes (4x Quick-release Connectors, 4x Tubing Connectors and 1x Polyurethane Tubing (2.4 m)). capstone software and 850 universal interfaces for recording the measurements</p>	1				
8	<p><b>Newton's Ring equivalent or above</b></p> <p>One Light box, halogen 12V/20 W  One Bottom with stem for light box  One Optical profile-bench for student experiments, I</p>	2				

	= 600 mm One Colour filter set, additive (red, blue, green) One Lens on slide mount, f=+50mm One Lens on slide mount, f=+100mm Two Slide mount for optical bench One Screen, white, 150x150 mm One Plate mount for three objects One Plate and lens f. Newton rings One Power supply, 230 V, DC: 0...12 V, 2 A / AC: 6 V, 12 V, 5 A One Measuring tape, length = 2 m					
9	<b>Digilent Basys 3 Artix-7 FPGA Trainer Board equivalent or above</b>	6				
10	<b>Michelson's Interferometer equivalent or above</b> 1x Hand Operated Vacuum Pump required to measure the index of refraction of air using the Introductory Michelson Interferometer. 1x Mini Laser with Bracket (Wavelength 633nm, Maximum Power < 1mW.) 1x Laser Alignment Bench of 1m length 1x Machined Base -- 5 kg 1x Three-Point Adjustable Mirror 1x Mounted Beam-Splitter 1x Mounted Movable Mirror 3x Accessory Mounts 1x Compensator Lens 1x Fitted Case 1x Gas Cell 2x Calibrated Polarizer 1x Glass Plate 1x Rotating Component Holder 2x Twyman-Green lenses 1x Instruction Manual Double Convex Lens (18 mm)	1				
<b>Total Cost (Inclusive of GST)</b>						

- The bid is submitted without any conditions.
- All the terms and conditions set forth by COMSATS University Islamabad in this tender are acceptable unconditionally, including **bid validity, delivery time & warranty.**

Name of Authorized Person:

\_\_\_\_\_

Date:

\_\_\_\_\_

Signature

\_\_\_\_\_

Official Company Seal:

\_\_\_\_\_

## 22. Technical Compliance Performance

(On Company's Letterhead)

Ref No: \_\_\_\_\_

NTN: \_\_\_\_\_

Date: \_\_\_\_\_

GST: \_\_\_\_\_

### Supply of Lab Equipment for Physics department

SN	Specification	Brand Name being offered	Compliance	Non-Compliance	Higher if any
<b>REF: Requirement For MP Physics Lab Equipment (FT# 582784)</b>					
1	<b>UTP3305 II DC Power Supply equivalent or above</b> Regulated 0~32 V, 335 W				
2	<b>Digital Function Generator Uni-T UTG9010c (LCD Version), 10MHz equivalent or above</b>				
	Waveforms Sine, Square, Triangle, Ramp, Pulse, TTL etc.				
	Amplitude Range (no load) from 1mVpp to 20Vpp				
	Accuracy $\pm 5\%$				
	Resolution 0.1mV				
	Frequency Range from 1Hz to 10MHz				
	Accuracy $\pm 1\%$				
	Resolution 1mHz				
	Output Power 2Wp-p				
	Output Impedance 50Ω				
	Attenuator 20dB + 40dB				
	DC Offset from -10V to +10V				
	Display Frequency: 4-digits-LED, Amplitude: 3-digits-LED				
	Duty Cycle from 10% to 90%				
	Distortion of Sine $\leq 2\%$ (at 1kHz)				
	Rise time of Square $\leq 35\text{ns}$				



	VCF $\geq 100:1$				
	Frequency Counter				
	Frequency Range from 0.2Hz to 10MHz				
	Amplitude Range from 0.5Vp-p to 5Vp-p				
	Input Impedance 10k $\Omega$				
3	<b>ADT-7000 Analog/Digital Trainer Board equivalent or above</b> Medium Sized Breadboard <b>Adjustable DC power supply</b> , fix (+3.3V, -3.3V, +5V, -5V, +12V, -12V), regulated (0V – 15V) <b>Analog Components:</b> resistors, capacitors, inductors, diodes, transistors (bipolar junction transistors and field-effect transistors), operational amplifiers (op-amps), and other passive and active components commonly used in analog circuits. <b>Digital Components:</b> Logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR), flip-flops (RS, D, JK, T), counters, shift registers, multiplexers, demultiplexers, analog-to-digital converters (ADCs), digital-to-analog converters (DACs), and other digital building blocks. <b>Input/Output Interfaces:</b> Interfaces for connecting external devices and sensors to the trainer board/kit, such as GPIO (General Purpose Input/Output) pins, analog input/output channels, and communication interfaces (e.g., UART, SPI, I2C). <b>Expandability:</b> Ability to expand or interface with additional modules or expansion boards to extend the functionality of the trainer board/kit for more advanced experiments. <b>Safety Features:</b> Built-in safety features such as overload protection, short circuit protection, and isolation to ensure the safety of students and equipment during experiments. <b>Portability and Durability:</b> Portable and durable construction suitable for classroom use and student experimentation.				
4	<b>UNI-T UTD2102CEX Digital Storage Oscilloscope equivalent or above</b> Channels 2 Bandwidth 100MHz Sample Rate 1GS/s				

	Rise Time $\leq 3.5\text{ns}$				
	Memory Depth 25kpts				
	Waveform Acquisition Rate $\geq 2000\text{wfms/s}$				
	Vertical Sensitivity(V/div) 1mV/div~20V/div				
	Time base Range(s/div) 2ns/div~50s/div				
	Storage Setup, Wave & Bitmap				
<b>REF: Requirement For BS Physics Program (File # 581399)</b>					
5	<b>Thermal expansion apparatus equivalent or above</b> One Base with built-in dial gauge and thermistor One Expansion tubes brass, copper and aluminum; 16 mm dia. (80 cm length), Basic digital multimeter.				
6	<b>Specific heat apparatus equivalent or above</b> Specific Heat Set SE-6849(One Aluminum 1.25" d x 1.5" h One Brass 3/4" d x 1.5" One Stainless Steel 3/4" d x 1.44" h One Zinc 3/4" d x 1.58" h One Copper 0.625" d x 1.8" h) PASPORT Temperature Sensor - PS-2125(One Stainless Steel Probe Two 3" Tubing, Polyurethane) One Calorimetry Cup with Lid Heater Stirrer - PS-3401(One Support Rod)Ohaus Triple-Beam Balance (without Tare) - SE-8723 One Graduated Cylinder, 50 mL One 1000-mL Beake Braided Physics String - SE-8050. Air Link capstone software, 550 and 850 universal interface for recording the measurements				
7	<b>Heat engine cycle experiment equivalent or above</b> One Heat Engine and Gas Law Apparatus includes (1x Heat Engine, one Air Chamber, one Rubber Stopper with hole, one Tubing with Quick-Connect Fittings, one Shut-Off Valve and one 200 g Mass) One Large Rod Base includes (Sturdy cast iron base Leveling feet (distance between feet is 26 cm) with two separate mounting holes for rods (diameter of rods supported 6.3 mm to 12.7 mm (1/4 inch to 1/2 inch) and Special three-point contact design for securely mounting rods provide necessary leveling capabilities. One Mass and Hanger Set includes (Four Mass hangers of 5.0 g with 3x 100 g mass (brass), 3x				

	50 g mass (brass), 6x 20 g mass (brass), 3x 10 g mass (aluminum), 3x 5.0 g mass (aluminum), 3x 2.0 g mass (plastic), 3x 1.0 g mass (plastic), 3x 0.5 g mass (plastic) and one Storage Case Two 3-Liter Plastic Tub (2 Pack) 1x Thread Three Stainless Steel Rods (Diameter 0.5in, Length=45 cm, 90 cm and 120cm)				
	one PASPORT Rotary Motion Sensor with Three-step pulley (10, 29, and 48 mm in diameter) and Rod clamp. One PASPORT Quad Temperature Sensor includes (2x Two Stainless Steel Temperature Probes and Three Fast Response Probes)				
	1x PASPORT Dual Pressure Sensor which can Measure pressure in Heat Engine includes (4x Quick-release Connectors, 4x Tubing Connectors and 1x Polyurethane Tubing (2.4 m)). capstone software and 850 universal interfaces for recording the measurements				
8	<b>Newton's Ring equivalent or above</b> One Light box, halogen 12V/20 W				
	One Bottom with stem for light box				
	One Optical profile-bench for student experiments, l = 600 mm				
	One Colour filter set, additive (red, blue, green)				
	One Lens on slide mount, f=+50mm				
	One Lens on slide mount, f=+100mm				
	Two Slide mount for optical bench				
	One Screen, white, 150x150 mm				
	One Plate mount for three objects				
	One Plate and lens f. Newton rings				
	One Power supply, 230 V, DC: 0...12 V, 2 A / AC: 6 V, 12 V, 5 A				
	One Measuring tape, length = 2 m				
	9	<b>Digilent Basys 3 Artix-7 FPGA Trainer Board equivalent or above</b>			
10	<b>Michelson's Interferometer equivalent or above</b> 1x Hand Operated Vacuum Pump required to measure the index of refraction of air using the Introductory Michelson Interferometer. 1x Mini Laser with Bracket (Wavelength 633nm, Maximum				
	1x Laser Alignment Bench of 1m length				
	1x Machined Base -- 5 kg				
	1x Three-Point Adjustable Mirror				
	1x Mounted Beam-Splitter				

	1x Mounted Movable Mirror				
	3x Accessory Mounts				
	1x Compensator Lens				
	1x Fitted Case				
	1x Gas Cell				
	2x Calibrated Polarizer				
	1x Glass Plate				
	1x Rotating Component Holder				
	2x Twyman-Green lenses				
	1x Instruction Manual				
	Double Convex Lens (18 mm)				

- The bid is submitted without any conditions.
- All the terms and conditions set forth by COMSATS University Islamabad are acceptable unconditionally, including **bid validity, delivery time & warranty**.
- I understand that blank technical sheet / non-mentioning of Brand and Model shall make my bid non-responsive and may result rejection of my bid.

Name of Authorized Person: \_\_\_\_\_

Date: \_\_\_\_\_

Signature \_\_\_\_\_

Official Company Seal: \_\_\_\_\_