Department of Physics

Indian Institute of Engineering Science & Technology, Shibpur
(Formerly Bengal Engineering & Science University, Shibpur)
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Ref.: Tender Advt. No. *01/IIEST/PHY/Web.Not./Lab.Equip/2022-23*, dated 10.02.2023

Notice Inviting Quotation

Sealed quotations are invited for supply of the following items/equipment or to carry out works listed below as per mentioned specifications. The relevant bidding document can be downloaded from the website. The document can be also obtained from the Department of Physics **(Contact: Head, Department of Physics)** between 11.00 a.m. and 5.00 p.m. on all working days. The quotation should **include all kinds of taxes/duties and delivery, Installation charges etc (GST 18 % should be quoted separately)** of the items and to be sent to the Office of the **Head, Department of Physics, IIEST, Shibpur, Howrah-711103**. Last date of submission of sealed quotation is **7 working days from the date of publication** in the Website of the Institute and tenders will be opened on the next working day at 12 noon.

10/02/2023

Head (Department of Physics)

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IIEST, Shibpur
Howrah-711103

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SECTION I: TECHNICAL SPECIFICATIONS: -

Item 1: Newton Ring Apparatus Complete Set (Quantity: 2 set)

Specification

Dimension: 390x480x170mm approx.
Micrometer: 0.01mm least count
Eyepiece: Ramsden 10x
Objective: 3x
Weight: 12.6kg approx.

Sodium Vapour Lamp with Cabinet and Power Supply :
Wattage : 35W
Operating Voltage : 230V

Item 2: LASER DIFRACTION (Quantity: 1 set)

Study of diffraction through gratings and measurement of wavelength of a LASER

Apparatus Specification:

Transmission Gratings : 100/300/600 Line per mm

LASER SOURCE: Wave Length 6500 Armstrong, 5 mw, Diode LASER

Optical Bench 1.5 meter with its all accessories.

Item 3: Franck Hertz Experiment (Quantity: 1 set)

- *Specification*

- Usage:- Laboratory Experiment
- Material :-Electronics

This experiment verifies that:

It is possible to excite atoms by low energy electron bombardment.

The energy transferred from electrons to the atoms always had discrete values.

The values so obtained for the energy levels were in agreement with spectroscopic results.

Thus the existence of atomic energy levels put forward by Bohr can be proved directly. It is a very important experiment and can be performed in any college or University level laboratory.

The Experiment is consists of the following:

Argon filled tetrode

- Filament Power Supply: 3.6-3.4V continuously variable
- Power Supply for VG1K: 1.3-5V continuously variable
- Power Supply for VG2A: 1.3 - 12V continuously variable
- Power Supply for VG2K: 0 - 95V continuously variable
- Saw tooth waveform for CRO display Scanning Voltage : 0-80V Scanning Frequency : 11520 Hz
- Multirange Digital Ammeter Display : 3 digit, LED
- Range : 10-7, 10-8 & 10-9 A

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- The instrument can, not only lead to a plot of the amplitude spectrum curve by means of point by point measurement, but also directly display the amplitude spectrum curve on the oscilloscope screen. This instrument can thus be used as a classroom experiment as well as for demonstration to a group of students.
- Analysis of Data:
- Data obtained for the excitation potential point by point are shown in Fig. 3. The readings are taken for 1V changes on grid 2 (VG2K). A significant decrease in electron (collector) current is noticed every time the potential on grid 2 is increased by approximately 12V, thereby indicating that energy is transferred from the beam in (bundles) "quanta" of 12eV only. Indeed, a prominent line in the spectrum of argon exists at 1048 corresponding to eV=11.83.

Item 4: Melde's Experiment: (Quantity: 1 set)

Specifications:

Size: 25 x 18 x 7 cm – Weight: approx. 1.6 kg. A simple experiment to study standing waves on a string. The Melde's Apparatus is a simple way to introduce students to the concept of standing waves. The apparatus consists of a string and an oscillator to generate different frequencies. Melde's experiment is ideal to study the behavior of standing waves. You can even visually determine wavelength, period and amplitude of waves. COMPONENTS : • Wave generator base • Metal rod with hook • U-shaped magnet • Clamp • Weight holder • String • Mass, 50 g (1 Set). LAWS & PRINCIPLES INVESTIGATED : • Standing waves on a string.

Item 5: Planck's Constant Experiment (Quantity: 1 set)

Determination of Planck's Constant And Work Function Of Materials By Photoelectric Effect.

- *Specifications:*

- Photo Sensitive Device: Vacuum Photo Tube.
- Light Source: Halogen Tungsten Lamp 12v/35w.
- Colour Filters: 635nm, 570nm, 540nm, 500nm & 460nm.

Accelerating Voltage: Regulated Voltage Power Supply

- Output: (+-)5V Continuously Variable Through Multi-Turn Pot
- Display: 3 1/2 Digit 7-Segment Led
- Accuracy: (+-)0.2%

Current Detecting Unit: Digital Nanoammeter It Is High Stability Low Current Measuring Instrument:

- Range: 1000 Microa, 100 Microa, 10 Microa & 1 Microa With 100% Over Ranging Facility
- Resolution: 1na At 1 Microa Range
- Display: 3 1/2 Digit 7-Segment Led
- Accuracy: (+-)0.20

Power Requirement: 220v (+-) 10%, 50hz

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Optical Bench: The Light Source Can Be Moved Along It to Adjust the Distance Between Light Source And Phototube. Scale Length Is 400 Mm. A Drawtube Is Provided to Install Colour Filters, A Focus Lense Is Fixed in The Back End.

Item 6: Four Probe SET-UP (Quantity: 1 set)

Four Probe Setup to measure the Resistivity at different temperature and determination of Band-gap of a semiconductor Sample.
Features:
Four Probe SET-UP, The set-up consists of three units
i. Oven Controller
Platinum RTD (A class) has been used for sensing the temperature. A wheatstone bridge and an instrumentation amplifier are used for signal conditioning. Feedback circuit ensures offset and linearity trimming and a fast accurate control of the oven temperature.
Specifications of the Oven
Temperature Range : Ambient to 473K Resolution : 1K Stability : ±0.5K Measurement Accuracy : ±1K (typical) Oven : Specially designed for Four Probe Set-Up Sensor : RTD (A class) Display : 3½ digit, 7 segment LED with autopolarity and decimal indication Power : 150W
ii. Multirange Digital Meter :
In this unit, intersil 3½ digit single chip A/D Converter ICL 7107 has been used. It has accuracy, auto zero to less than 10 µV, zero drift-less than 1 µV/ °C, input bias current of 10 pA and roll over error of less than one count. Since the use of internal reference causes the degradation in performance due to internal heating, an external reference has been used.
Specification of Digital Meter:
Range : X1 (0-200mV) & X10 (0-2V) Resolution : 100µV at X 1 range Accuracy : ±0.1% of reading ±1 digit Display : 3½ digit, 7 segment LED with autopolarity and decimal indication Overload Indicator : Sign of 1 on the left & blanking of other digits.
iii. Constant Current Generator :
It is an IC regulated current generator to provide a constant current to the outer probes irrespective of the changing resistance of the sample due to change in temperatures. The basic scheme is to use the feedback principle to limit the load current of the supply to preset maximum value. Variations in the current are achieved by a potentiometer included for that purpose. The supply is a highly regulated and practically ripple free d.c. source. The current is measured by the digital panel meter.
Specification of Constant Current Generator
Open circuit voltage: 18 V Accuracy : ±0.25% of the reading ±1 digit Current range : 0-20 mA Load regulation : 0.05% for 0 to full load Resolution : 10 µA Line regulation : 0.05% for 10% changes
iv. Semiconductor Sample:
Germanium crystal in the form of a chip (10X9X0.5mm)

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SECTION II: TERMS & CONDITIONS

1. The last date of receipt of quotation is valid **for 07 working days** from the date of publication of this notice. Quotations received later will not be entertained under any circumstances.
2. Potential suppliers must submit the quotations in Sealed Cover envelope to the office of the Department of Physics, IIEST, Shibpur in the following address:

HEAD

Department of Physics

IIEST Shibpur, Howrah - 711103

3. Item name& tender code must be mentioned on top of the sealed envelope otherwise the quotation will not be accepted.
4. The quoted price must be inclusive of all Taxes in INR, duties and levies mentioning clearly any Freight and Insurance charges. Inclusion of Tax/Levy at later stage will not
5. be accepted. If GST is chargeable then quoted price must be inclusive of GST in @INR **18%.**

   Price should be CIF, IIEST, Shibpur basic. (Clearing charges and Custom Duty will not be paid extra, it should be included with base price.

6. Vendor should have proven track record of working in Govt. / Non-Govt Organization.
7. Commercial Papers should be duly signed & must be attached.
8. Photo Copy of Manufacturer Authorization for this specific tender must be provided. OEM certification, including FCC, UL, Epeat Gold, required.
9. All the equipment and accessories will carry a warranty for a period of 12 months from the date of commissioning. Warranty for all the items supplied will be on an 'all comprehensive' basis, i.e., including repairs, replacements, maintenance, etc. Calibration / Test Certificate must accompany along with the equipment. The supply of equipment shall include installation, erection, commissioning, and demonstration. Indian Institute of Engineering Science and Technology, Shibpur, Howrah reserves the right to accept/ reject all or any of the bidders without assigning any reason whatsoever.
10. The validity of the quotation must be for a period of 6 months without any modifications in its terms and conditions.
11. IIEST, Shibpur, reserves the right to accept / reject all or any of the tenders without assigning any reason whatsoever.
12. No advance payment will be made before the delivery of the item.
13. Custom Duty Exemption Certificate will be provided by the IIEST (If applicable).
14. Bidder must be mention make and model no. of the offered items and include catalog with the quotation.
15. Documents to be submitted with the Quotations:

- General Conditions (Section I) and Important Instruction (Client list) in original duly signed by the Proprietor/ Partner/ Director or any authorized person of the company as a token of acceptance of Terms and Conditions of Tender.
- The signed photo copy of latest Income Tax, Sales Tax, Professional Tax, GST clearance certificates, PAN and valid Trade License must be submitted.

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