

PURCHASE ORDER

Reference No: TEQIP-III/2018/duie/Shopping/20

Date of Issue: 08-Aug-2018

Subject: DUIET/TEQIP2/PHYSICS

Purchaser: Dibrugarh University Institute of Engineering &
Technology, Dibrugarh

Dibrugarh University, Dibrugarh, Assam- 786004.

Supplier Name: A & B Associates

Govinda trade centre, West Baragoan Chowk, N.H-
37, Guwahati-35, assam, Guwahati, Assam, 781035

With reference to our correspondence, **Dibrugarh University Institute of Engineering & Technology, Dibrugarh** is pleased to award this detailed Purchase Order to A & B Associates for supply of items as per the details given below at a total cost of 653105.00 (<Six lakhs fifty three thousand one hundred five only>):

| Sr. No | Item Name | Quantity | Unit Cost (Rs.) | Total Cost (Rs.) | Delivery Period |
|--------|---|----------|-----------------|------------------|-----------------|
| 1 | Cathode ray oscilloscope with function generator. | 4 | 28400 | 113600 | 30 |
| 2 | Damped LCR circuit with sine wave oscillator | 5 | 6240 | 31200 | 30 |
| 3 | He-Ne laser | 2 | 29400 | 58800 | 30 |

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|----|---|---|-------|-------|----|
| 4 | Joule's calorimeter | 5 | 2200 | 11000 | 30 |
| 5 | kerr cell, Beam splitter | 1 | 65400 | 65400 | 30 |
| 6 | Meldes string apparatus | 5 | 3700 | 18500 | 30 |
| 7 | Newton's ring Apparatus | 5 | 3700 | 18500 | 30 |
| 8 | Newton's law of cooling apparastus | 5 | 1300 | 6500 | 30 |
| 9 | Newtons ring arrangements | 5 | 3700 | 18500 | 30 |
| 10 | NPN junction transistor | 5 | 3700 | 18500 | 30 |
| 11 | optic fibre cable with photo detector | 1 | 34200 | 34200 | 30 |
| 12 | Plane transmission Grating with light source. | 3 | 27560 | 82680 | 30 |
| 13 | polariser ,analyder ,photodetector. | 1 | 43750 | 43750 | 30 |
| 14 | Ressonance tube | 5 | 2145 | 10725 | 30 |
| 15 | Searle's apparatus | 5 | 3990 | 19950 | 30 |
| 16 | Solar cell | 5 | 3990 | 19950 | 30 |
| 17 | Thermocouple, temprature bath with heating arrangement. | 5 | 7275 | 36375 | 30 |
| 18 | Torsional pendulum | 5 | 2775 | 13875 | 30 |

Total price (without taxes) : **Rs. 622005.00**

Total applicable taxes : **5 %**

Total price (with taxes) : **Rs. 653105.00**

Total Octroi : **Rs.**

Delivery : Dibrugarh University Institute of Engineering & Technology,
Dibrugarh

Testing/Installation
Clause (if any) : yes

Training Clause (if any) : yes

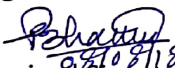
Technical Specifications : As per Annexure - 1

Delivery Period : As specified for each item from date of issue of confirmed
purchase order or as early as possible.

Warranty : 36

Payment Terms :
Delivery and Installation - 100% of total cost
Satisfactory Acceptance - 0% of total cost

For
Dibrugarh University Institute of Engineering & Technology, Dibrugarh


(Authorized Signatory)

Name & Designation

Accepted by

Signature

Date

Address


Date 9/8/18
Grounda Trade Centre, West Boragan Chok, NH-37,
Guwahati - 35 Assam.

Annexure I

| Sr. No | Item Name | Specifications |
|--------|---|--|
| 1 | Cathode ray oscilloscope with function generator. | Cathode ray Oscilloscope (30 MHz) Vertical Deflection: Deflection Coefficient: 5mV to 5 V/div, 10 calibrated steps 5mV/div to 5 V/div in 1-2-5 seq Accuracy: $\pm 2\%$ Time Base: Time Coefficient: 18 calibrated steps in 1-2-5 seq 0.1 μ s/div to 0.1s/div Accuracy: $\pm 2\%$ Hold off time: Variable control to app 1:10 Display: 8 x 10 cm Should be provided with BNC cables and instruction manual Function Generator: Frequency: 0.3 Hz - 3 MHz Waveform: Sine Square Pulse Ramp/Triangle Amplitude: 2mVppto10Vpp (50ohms) Necessary cables and instruction manual should be provided with |
| 2 | Damped LCR circuit with sine wave oscillator | The Kit should consists of One board having following Build in parts. a. Three resistances b. Three capacitances c. Three inductances d. Ammeter e. Voltmeter f. Sine wave oscillator (100 Hz-100 kHz) g. Instruction manual |
| 3 | He-Ne laser | The kit should consist of : Diode Laser Peak wavelength :635nm Operating voltage :5V DC Operating current :250 mA Optical power :0.4-0.8 mW Laser product :Class II Operating temp.:0-40oC He-Ne laser Wavelength :632.8nm Working current :4mA-6mA Output power :>2mW Working time :>8hrs Working voltage :AC220 V \pm 22V Input Power :<2W Dimension :300x62x82mm Optical bench triangular Material :Aluminum extrusion Type :Triangular shape Scale :0-100cm Least count :1mm Object Screen Material : Translucent, Acrylic. Size : 300x300mm Diffraction slits set Frame Size :50mmx50mm Slit: Width=0.06mm and Separation=0.20mm (Single, Double, Three, Four, Five and Six) Coarse Grating-1: 4 lines/mm, line/space ratio 3:1 Coarse Grating-2: 4 lines/mm, line/space ratio 6:1 Coarse Grating-3: 8 lines/mm, line/space ratio 3:1 Diffraction grating:80lines/mm Diffraction grating : 300lines/mm Single slit : Tapered Double slit : Tapered Metal gauze : 300 mesh Circular apertures : 1.0, 0.60, 1.40, 0.30mm Polaroids : 50mmx50mm linearly polarized Lens in |

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| | | holder Focal length Dia. -10cm 40 6cm 40 +10cm 40 +20cm 40 Slit holder with mounting rod Clear Aperture :45x45mm Object holder :Clip type Prism Table with mounting rod Disc :75mm diameter Cylindrical Base Material : Ferrous Mount : Rod 10-14mm dia : Flat object up to 10mm Groove : Slide object, 30x10mm(LxW) Instruction manual should be provided |
| 4 | Joule's calorimeter | The kit should contain Two metal container one placed inside the other with air insulation and covered with a lid Resistance coil mounted through socket in the lid Power supply Instruction manual |
| 5 | kerr cell,Beam splitter | The kit should Consist of: Kerr Cell Electrode gap: 1 mm Voltage limit: 5 KV DC max Halogen light source Halogen bulb :12V, 50W Operating voltage :12V, 5A Optical bench triangular Material :Aluminum extrusion Type :Triangular shape Scale :0-100cm Least count :1mm Transversal slider with proper height and base which can be fitted in the bench (1 No) Material :Aluminum extrusion Least count :0.01mm Fixed Slider with proper height and base which can be fitted in the bench (4 Nos) to hold lens, detector, polarizers, object screen, Kerr cell etc. Material : Aluminum extrusion Fixed Slider large width (01 No) to hold lamp Material :Aluminum Extrusion Photo Detector with rod Detector : silicon photocell Terminals : with safety socket Aperture :1mm Object Screen with rod Material :MS sheet High Voltage power supply Input Voltage:230VAC, 50Hz Output Voltage:0-6 KV DC 6.3V AC/2Amp Display :3 1/2 digit LED Current limit :50µA and 2mA(max) Power supply Output : 2, 3,4,5,6,8,10 and 12 VAC full wave rectified D.C. Input : 230 V AC,50 Hz Polarizer/Analyzer (02 Nos) with rod Angle :Adjustable (0o-90o) Frame : blackened, to avoid scattering of light Least count :1o Convex Lens in holder with rod Focal length : 100mm All the optical components like lens, polarizers should have compatible dimension Power cord Current :6Amp max Voltage:250Vmax Length:3mtr.approx Pins : Neutral, Face, Earth Connecting lead Length :100cm Type :Banana plug Digital Multimeter Digital Display :3999(max) Direct current and voltage measurement AC Current and Voltage measurement Resistance measurement Frequency measurement Capacitance measurement Temperature measurement Continuity mode Diode measurement mode Auto range mode Set of filters Colour: Red, Orange, Yellow, Green, Blue Instruction manual should be provided |
| 6 | Meldes string apparatus | The kit Should include the following items: a. Steel fork b. Cast iron base c. Electromagnet d. Weight box e. Voltage source 0-12V f. Pulley with clamp g. Reel of thread h. Meter scale i. Scale pan j. Instruction manual |
| 7 | Newton's ring Apparatus | The kit Should consists of : : Newton's Rings Apparatus with Micrometer : 0.01mm least count Eyepiece: Ramsden 10X Obejective: 3X Plano Convex |

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| | | Lens made of glass (Dia: 61.5 mm, Focal Length: 200mm) Plane glass plate pair (50×35×2mm) Plain glass (108×70×1.2mm) Spherometer Type: 3legs Vertical scale: 6mm×6mm(W×T) Range : 10-0-10mm Least count : 0.01mm Spherometer should be able to measure radius of curvature of the lens provided Instruction manual should be provided |
| 8 | Newton's law of cooling apparatus | The apparatus should be consisted of Two units each with double walled joint less brass vessels polished with non conduction cover through which a copper calorimeter is suspended. Another covering should protect the top of the calorimeter from dust and heat losses The annular spaces between the double walled vessels are connected by T- tubes. Instruction manual |
| 9 | Newtons ring arrangements | The kit Should consists of : : Newton's Rings Apparatus with Micrometer : 0.01mm least count Eyepiece: Ramsden 10X Obejective: 3X Plano Convex Lens made of glass (Dia: 61.5 mm, Focal Length: 200mm) Plane glass plate pair (50×35×2mm) Plain glass (108×70×1.2mm) Spherometer Type: 3legs Vertical scale: 6mm×6mm(W×T) Range : 10-0-10mm Least count : 0.01mm Spherometer should be able to measure radius of curvature of the lens provided Instruction manual should be provided |
| 10 | NPN junction transistor | The kit should contain A board with two 0-10V D.C. at 50mA, continuously variable Power Supplies for Base Emitter & Collector Emitter junctions. Two Digital Voltmeter DC 3½ Digit Having Dual range of 2V / 20V. Two Digital Current meter DC 3½ Digit Having Dual range of 200mA / 20mA Two silicon (NPN & PNP) transistors and two Germanium (NPN & PNP) transistors. Instruction manual |
| 11 | optic fibre cable with photo detector | The kit should contain 1 meter and 5 meter PMMA patchcord In-line SMA adaptor Mandrel Numerical aperture measurement Zig Fiber Optics trainer Speaker Mic Circular screen Instruction manual |
| 12 | Plane transmission Grating with light source. | Dispersive and resolving power kit The kit should contain Spectrometer Objective: Achromatic lens, f=178mm Eyeiece: Ramsden eyepiece, 15× Reticle: 90o cross etched on glass Sodium light source with lamp house and voltage source Input Voltage :220V, 50Hz Prism Diffraction grating Lines/inch :15000 Micrometer slit Pitch :0.5mm Least Count :0.005 mm Magnifier with LED Light :LED (cell operated) Proper Allen Key set should be provided with Instruction manual should be provided |
| 13 | polariser ,analyder ,photodetector. | Polarization and Malu's law verification kit The kit should consist of : He-Ne Laser Wavelength :632.8nm Working current :4mA-6mA Working time :>8hrs Output power :>2mW Working voltage :AC220 V±22V Input Power :<2W Photo Detector with rod Detector : preferably silicon photocell with safety socket Aperture :1mm Optical Bench Material :Aluminum alloy Scale :0-100 cm Least count :1mm Optical Bench- 1 meter Polarizer/Analyzer (2 Nos) with blackened frame Angle |

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| | | :Adjustable (0o-90o) Least count :1o Should be provided with proper mounting arrangements, 03 Nos of fixed saddles and 01 No of transverse saddle(motion in X-Y axis) Digital multimeter Resistance :200?,2000?,20k,200k and 2000k? D.C Voltage :200 and 2000mV :20,200 and 600V A.C Voltage :200 and 600V D.C current :200 and 2000μA :20 and 200 mA :10A Testing :Diode and Transistor Battery :9V Connecting lead Length :100cm Type :Banana plug |
| 14 | Ressonance tube | The kit should consists of : Tuning fork set Stand base Stand rod Al vessel Acrylic tube Rubber Pipe Scale Instruction manual |
| 15 | Searle's apparatus | The apparatus should contain Searle's apparatus, brass body with integrated weight hanger upto 5 kg. Incorporated with spirit level 2 nos of integrated long steel wire of same length and diameter Micrometer head with least count 0.01 mm A set of 10 loads with holder (0.5 kg each) and dead load with weight same as the weight hanger Instruction manual |
| 16 | Solar cell | The kit should consist of Circuit board Decade resistance box Digital Multimeter- 2 Nos Flexible Lead Set (50cm) Lamp source Solar Module Switch module Power supply Cylindrical Base Set of intensity filters Instruction manual |
| 17 | Thermocouple,tempreature bath with heating arrangement. | The Kit should consists of a. Unit of electronic standard cell 1.018V, Battery eliminator 2V/100mA, Rheostat 0-5 K ohm b. Hot Plate c. Resistance box, dial type d. Flexible plug leads e. Thermocouple copper-iron f. Arrangement for holding thermocouple g. Instruction manual |
| 18 | Torsional pendulum | Moment of Inertia apparatus The kit should contain Torsional pendulum with cradle consisting of an aluminum disc of approximately 6" dia with a groove. The circular aluminum disc supports five semicircular masses which just fit into a groove, concentric with the circumference. It should be suspended by a steel wire pivoted at the centre of a long frame work, provided with circular base which is also fitted with leveling screws. Four different shapes of mass (Sphere, cuboid, cylinder, rectangular cuboid) should be provided. Instruction manual |