

## University of Kerala

Department of Physics Kariavattom Campus, Thiruvananthapuram-695581 Kerala

No. Phy/219/2021-2022

13.04.2021

### QUOTATION NOTICE

Quotations are invited for the purchase of following items for research purpose. Kindly quote lowest price for items and the price may include admissible reduction and 5% GST. The items should be delivered at Department of Physics, University of Kerala, Kariavattom, Thiruvananthapuram without any transportation/extra charges.

#### HEAD : CHEMICALS

S. No	Item	Make	Quantity/Number
1	Ethanol	NA	1L
2	Methanol	NA	5L
3	Extran	Merck	5 L
4	Zinc Chloride	Merck 1.93623.0521	500 gm
5	Aniline	Nice	500 ml
6	Ammonium persulphate	Nice	500 gm
7	Nitric Acid	Merck	500 ml
8	Sulphuric Acid	Merck	500 ml
9	Hydrochloric acid	Merck	500 ml
10	Beta – carotene (dye)	Sigma c9750	5 g
		TCI c0560	5 g
11	Lycopene (dye)	LR grade	5 g
12	Isopropanol	Nice	1 L
13	Oleic acid	Merck/Nice/TCI	100ml/500 ml
14	Tin (II) Chloride dihydrate	Merck 1.93612.0121	500 gm
15	HCl (35%)	Merck 1.93401.0521	500 ml
16	Nitric Acid (69%)	Merck 1.93406.0521	500 ml
17	H <sub>2</sub> SO <sub>4</sub> (98%)	Merck 1.93400.5021	500 ml

#### HEAD: CONSUMABLES

S. No	Items	Specification	Quantity/ Number
1	Micro glass slide	• 75 mm × 25 mm × 1.1 mm	10 packets
2	Nitrile Glove	Size - Medium	3 packs of 100 pair
3	Laboratory Mask	• 3 Layer Non Woven Fabric	3 packs of 50

		<ul style="list-style-type: none"> <li>• Nose pin</li> <li>• PPE &gt; 93%</li> <li>• BFE &gt; 98%</li> </ul>	numbers
4	ITO coated glass substrate	<ul style="list-style-type: none"> <li>• 8-12 <math>\Omega</math>/sq</li> <li>• 75 mm <math>\times</math> 25 mm <math>\times</math> 1.1 mm</li> </ul>	5 packets
5	Soldering station	<ul style="list-style-type: none"> <li>• Iron tip</li> <li>• Iron holder</li> <li>• Temperature controller</li> <li>• Manual</li> </ul>	1
6	Digital Multimeter	<ul style="list-style-type: none"> <li>• Count: 6000</li> <li>• AVG responding, Capacitor: 100.0 <math>\mu</math>F</li> <li>• Voltage: DC: 600 volts; AC: 600 volts; DC Accuracy: <math>\pm</math> 0.5% + 3 digit; AC Accuracy: <math>\pm</math> 1% + 3 digit</li> <li>• Resistance: 40 M ohm; Resistance Accuracy: <math>\pm</math> 1.5% + 3 digit</li> <li>• Capacitance: 100 <math>\mu</math>F</li> <li>• CAT III 600 volts safety rated</li> <li>• AC/DC voltage, resistance, capacitance, frequency measurement</li> </ul>	1
7	Tissue Paper	White	5 rolls
8	Aluminium Foil	NA	5 packets
9	Cotton Waste	White	5 kg

#### HEAD: EQUIPMENT

S. No	Items	Specification
1	Programmable dip coater	<ul style="list-style-type: none"> <li>• Single guide rod</li> <li>• Dipping containers – 4</li> <li>• Traveling Distance: 0-75 mm Adjustable</li> <li>• Dipping/Pulling Speed: 1-200 mm/min Programmable</li> <li>• Temperature Range: 50-100°C (+/-1°C accuracy)</li> <li>• Dwell Time: 0-999 seconds (in liquid time)</li> <li>• Dry Time: 0-999 seconds</li> <li>• Dipping Position (turning): 1 – 4 positions</li> </ul>
2	Light Intensity meter	<ul style="list-style-type: none"> <li>• Measure in Lux or Foot-candles, With One Button to Switch Between Display Options</li> <li>• Measuring Range Up to 20,000 Lux or Foot Candles</li> <li>• Data Hold to Freeze Reading on the Digital Display</li> <li>• Min/max Ability to Show High and Low Readings</li> <li>• Auto Power Off to Save Battery Life</li> </ul>
3	Voltammetry cell kit	<ul style="list-style-type: none"> <li>• Glass vial- 4 nos</li> <li>• Cell top- 1 No</li> <li>• 3mm dia GCE working electrode – 1 No</li> <li>• 2 mm dia Gold working electrode</li> <li>• Ag/AgCl reference electrode-1 No</li> </ul>

		• Pt wire counter electrode
--	--	-----------------------------

**HEAD: SOFTWARE**

S. No	Item	Specification
1	Solar cell Characteristics Simulation Software	<ul style="list-style-type: none"> <li>• Materials Library- Semiconductors, Perovskites</li> <li>• Simulate 1D and 2D device structure</li> <li>• Simulation of illuminated and dark current voltage behaviour</li> <li>• Single user licence</li> </ul>

The firms who wish to supply the items are requested to submit the sealed quotations to "Dr. R. Jayakrishnan, Principal Investigator, Development of Photovoltaic Research Laboratory, Department of Physics, University of Kerala, Kariavattom, Thiruvananthapuram, Pin- 695 581, Kerala" on or before 30.04.2021 by 03:00 pm. The quotations will be opened at 02:00 pm on 03.05.2021 in presence of vendors then present, following COVID19 restrictions imposed by Government. The sealed cover should be super scribed with "Quotation under Ref No \_ \_ \_ \_ \_ for item HEAD \_ \_ \_ \_ \_ under Serial No. \_ \_ \_ \_ \_"

**Conditions**

1. Total amount including all charges and taxes should be quoted.
2. GST % details should be mentioned (GST No of University: 32AAAJU0328FIZJ)
3. Complaints with the items supplied should be rectified/ replaced to the satisfactions of the university by the suppliers at their own cost.
4. Payment will be made only after the supply of the chemicals at our own site.
5. The undersigned reserves the right to reject/accept any quotation without assigning any reason.
6. All equipments should have 2 year Onsite warranty



*[Signature]*  
**Head**  
 Department of Physics  
 University of Kerala  
 Kariavattom-695 581

*[Signature]*  
**Dr. R. Jayakrishnan**  
 Dr. R. Jayakrishnan  
 Principal Investigator  
 DPRL Project  
 Department of Physics  
 University of Kerala  
 Thiruvananthapuram - 695581