Deshbandhu College (University of Delhi), Kalkaji, New Delhi-110019

List of apparatus to be purchased in Physics Department-2018

S. No.	Name of the Apparatus	Estimated Cost per item (in INR)	No. of items	Total Cost (in INR)
1.	**Measurement of Susceptibility of Paramagnetic Solids by Gouy's Method**		**01**	
	➢ **Digital Balance** • Capacity: up to maximum 100 gm • Readability : 0.0001gms or better • Repeatability : (+/-) 0.1mg • Linearity : (+/-) 0.2mg or better • Complete with weigh below hook feature • Sample should be in the form of a long rod (Aluminium) of around 10 cm and Glass Tube ➢ **Electromagnet** • Magnetic Field: approx. 20 Kilo Gauss • Two coils in series and parallel combinations ➢ **Constant Current Power Supply** (Protection against the overload/short-circuit) • Current Range :Smoothly adjustable • Display: 3½ digit, 7 segment LED DPM • Power: 220V ±10%, frequency 50Hz ➢ **Gauss meter** • Resolution: 1 gauss at 0 to 2 kilogauss range or better • Range : 0 to 2 KG (higher resolution) and 0 to 20 KG with switchable adjustment • Accuracy :±0.5% or better • Working temperature: Up to 50°C			

	• Display :3½ digit, 7 segment LED DPM with auto polarity • Power: 220V ±10%, 50Hz • Transducer: Hall Probe – InAs • Special Feature Indicate the direction of the magnetic field • The whole set should be covered in cabin for safety. It should be complete in all respect.			
2.	**To measure the Dielectric Constant of a dielectric Materials with frequency**		**02**	
	➢ **Dielectric Constant** • Dielectric constant measurement facility • Frequency range: sweep frequency from 1 kHz to 1 MHz (at least 03 frequencies) • Standard sample (known dielectric constant at room temperature) with sample holder • Display for voltage and current measurement System should have at least ➢ BNC leads 04 Nos. ➢ Power chord ➢ Manual with description of apparatus and test readings			
3.	**To determine the coupling coefficient of a piezoelectric crystal**		**02**	

	• Input AC: 5 V • Input impedance 50 Ohm • Output Signal 5V AC • Frequency range 520 Hz to 1 KHz • Accuracy 1% or better • Resolution 0.1% • Output for measurement in DPM • Standard samples for measurement with sample holder for pellet • Output leads • Power chord			
4.	**Set up to determine Mechanical Equivalent of Heat (J) by Callender and Barne's constant flow method**		**02**	
	• Complete set up with leak proof, heavy Gauge material construction, teak wood Base, • Necessary vessels/cylinders made of brass, • Heater fitted in glass tube covered with wooden block & inside glass wool, • Polypropylene aspirator bottle of 10 liter Capacity, • Beaker made of Copper 1000 ml capacity-2 Nos., • Graduated plastic measuring cylinder of 250 ml capacity, • Four thermometers of 10-250 ˚C Range, • Unit shall be supplied with necessary good quality voltmeter and ammeter , mounted in Bakelite desk type stand with insulated terminals, standardized-spring loaded jewels, • Power Supply of accurate control having battery eliminator, rheostats necessary weighing scale and silicon special tube for the experiment (6 meters per set).			

5.	**To analyze the elliptical polarized light by using Babinet's Compensator**		**02**	
	• Polarizer and analyzer made of Polaroid sheet should be mounted in rotators graduated in 360° (Least count of rotation 1°). • A Rectangular Box with micrometer head having one quartz wedge mounted on running slide and other quartz is fixed to it. • Quartz wave plate should be mounted in a rotator graduated in 360° (Least count of rotation 1°) • SOURCE ▪ Table lamp superior quality ▪ Sodium Vapour Lamp with choke and enclosure			
6.	**Arbitrary Wave Function Generator**		**05**	
	• Frequency band width (sine) 10 MHZ with 1 μHz resolution • No of channel: 02 • Standard wave form: Sine square, Ramp , Pulse. • Sample Rate (max): 125 MS/s • record Length (max) 16K • Amplitude range (Max): 2mVp-p-to 10VP-P • Modulation AM, DSB AM, FM, PM, FSK, ASK, PWM,			

	• Internal: USB Host& USB device • Display: min 3.5"colour LCD or more • Built up frequency counter up to 200MHz • IP Protection IP 20 • Power supply: 230 V 50 Hz • Accessories: User manual power cord, PC communication, software with USB cable and calibration			
7.	**IC Tester (Universal) with digital display**		**01**	
8.	**Optical Lever Experiment Set up to determine the Young's Modulus**		**01**	
	• Steel wire • Tripod Stand • Weights set (Brass) with hanger • A telescope magnification 3x with a Ramsden eyepiece & a cross line reticule & mounting arrangement for telescope. • Wall Bracket			
9.	**Magnetic stirrer with hot plate**		**05**	
	• Temperature sensor • PT1000 controls and real-time display setting and actual temperature • LED display displays temperature and speed. • ABS casing with fire retardant material, resistance of weak acid and alkali • Fully closed assembly guarantees safety and long service life, effectively prevents the liquid spill out of the working plate and flow into the unit, maximally protect the components inside from risk of foreign damage. • HOT warning indicates residual hotplate temperature • Specifications MS-H280-Pro			

	• Stirring point position quality 1 • Max Stirring quantity (H_2O) [1] 3 • Max. Magnetic Bar[mm] 50 • Motor type DC Motor • Motor rating input[W] 5 • Motor rating output[W] 3 • Speed range[rpm] 0-1500 • Speed display LED • Speed display accuracy[rpm] 1 • Work plate material Stainless steel • Dimension of work plate[mm x mm] 135 • Heating power[W] 500 • Heating rate (1L water) [K/min] 6 • Temperature range[C°] RT – 280 • Temperature display LED • Temperature display accuracy [C°] 1 • Safety Temperature[C°] 320 • Temperature sensor of extra position PT1000 • Dimension[mm] 260 x 150 x 80 • Weight[kg] 1.8 • Voltage [VAC] 100~120/200~240 • Frequency[Hz] 50/60 • Power[W] 515 • Permissible ambient temperature[C°] 5 – 40 • Permissible relative humidity 80%			
10.	**Hydrothermal oven**		**01**	
	• Maximum temperature: 250oC • Working temperature: 200oC			

	• Temperature Accuracy: ±1oC • Inner Chamber: stainless steel • Inside trays: Minimum two with Nickel Plated • Outer Body: Power coated with rust protection • Air circulating fan for uniform heating • Temperature controller Microprocessor PID • controller Minimum size: 450 mm (W) x 450 • mm (H) x 450 mm (D) • Power supply: 220 Volts, single phase AC • supply			
11.	**Weigh balance**		**01**	
	• Weighing range: 0 to 100 g • Readability: 0.01 g • Linearity: ± 0.02 g • Repeatability: 0.01 g • Weighing pan: Stainless steel • Display: LCD display			
12.	**Microwave oven**		**01**	
13.	**Consumables**			
	• Silver paste • Gloves • Masks • Substrate (silicon, FTO, ITO, Au coated Si) • Anodic Aluminum oxide templates • Diamond cutter • Chemicals			

	• Spatula and twizzers • Sample boxes and Whatman paper • Tissue papers • Glass wares: beakers, test tubes, flask Magnetic beads			
14.	**Teflon lined hydrothermal (Autoclave)**		**01**	
	• Description: • It is used for the hydrothermal synthesis reaction. • It is inner Teflon lined and outer made from • stainless steel. It is operated at high pressure and • high temperature. • Specifications of Teflon Lined Autoclave: • Size: 50 ml • Safe Temperature: 230°C • Max Operating Temperature:250°C • Heating and Cooling Rate: ≤5°C/min • Material: Shell made of high-quality • stainless steel (304) Inner Shell: Teflon			
15.	**Ultrasonic bath**		**01**	
	• Continuous Self Tuning Circuitry for Any change In Workload, Liquid Level and Bath Temp. • Using 40 KHz Frequency For Effective Cleaning With Low Noise • Designed For Complete Cleaning Of Small and Large Components Without Dismantling, • Inner tank and Outer body made of Stainless Steel • Tank Volume (liters) 3 Ltrs.			

	• Ultrasonic Wattage 100 W • Ultrasonic Frequency 40 ± 3 KHz • Tank Dimension (Taper) LxWxH (mm) 240 x 140 x 100 • Outer Dimension LxWxH(mm) 270 x 170 x 240 • Heating Ambient to 80°C Digitally Controlled(Dual Display) • Digital Timer 1 - 99 Minutes • Inner Tank Material Stainless Steel • Outer Housing Material Stainless Steel • Power Supply 220 Volts , Ac 50 Hz, Single Phase			
NOTE: More than one setup has been put in above list of experiments, keeping in mind the total strength of the students in each class. Wherever, only one setup has been put it is to high cost of the equipment.		**TOTAL COST (INR) =**		

(Principal)

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List of apparatus to be purchased in Physics Department-2018

02.12.2019

Quotations are invited in sealed envelope for the following apparatus with their specifications on or before 17.12.2019 for the Physics department.

Terms and Conditions:

1. The quotations should contain the complete technical specifications.
2. Please quote for one-year on-site service warranty.
3. The quotation should be valid for 120 days from the date of submission.
4. The price quoted should include all taxes including GST, delivery and installation.
5. Interested vendors for awards of purchase order will have to submit a sample, before the committee for approved.
6. The number of items to be purchased may increase or decrease at the sole discretion of the college.
7. The college reserves the right to cancel/call off any quotation without assigning any reason/s.
8. The items are to be delivered within 15 days of the receiving the Purchase Order.
9. The college reserves right to place order of an individual unit/product or the complete list of items mentioned.

Sd/-

CONVENOR
PURCHASE COMMITTEE

Sd/-

PRINCIPAL