

Specifications

S.N.	Items	Specifications/Features
1	Digital Flame Photometer	<p>Range: Na: 0-100 ppm, K :0-100ppm Sensitivity: Na: 5ppm & K:5 ppm Display: Dual 2/12 digit bright LED Display Accuracy: +2% upto 100 meq/+ 5% above 100 meq Repeatability : +2 Count Detector: Silicon photodiode Filters: Narrow band interference glass filters Flame System: LPG and dry oil free air Warm up time : 10 minutes Power : Supply 230 V +10% AC 50Hz</p>
2	pH Meter	<p>Range: -2.000 to 16.000 pH, -2.00 to 16.00 pH, ± 1000 mV pH Resolution: 0.001 pH, 0.01 pH, 0.1 mV pH Accuracy: ± 0.002 pH, ± 0.01 pH, ± 0.2 mV pH calibration: 5 points (Standard mode) 1.68, 4.01 (3.00\dagger), 6.86, 7.01, 9.18, 10.01, 12.45, and two custom buffers; 3 points (Basic mode) 4.01; 6.86; 7.01; 9.18; 10.01 pH temperature Compensation: ATC: -5.0 to 100.0$^{\circ}$C; 23.0 to 212.0$^{\circ}$F* Power Supply: 230VAC to 5 VDC adapter (included) Connectivity: 1 micro USB port for charging and PC connectivity, 1 USB port for storage</p>
3	Photo Colorimeter	<p>Standard Glass filters: 8 (wavelength 400-700nm) Min. Volume: 1ml Display: 3 digit, bright red 7 segment Keyboard: 1 key soft touch membrane type Absorbance: 0 to 1.99 Resolution: 0.01 Accuracy: 0.5% FSI Detector: Photodiode Light Source: 6.3V-0.3 Amp, Tungsten Lamp Power Supply: 230 V+10% 50 Hz</p>
4	Conductometer	<p>Display : 3.5 digit LED Range: 0-100 mhos/cm, Auto ranging Accuracy: +1% FS +1% Temperature Compensation: Manual 0-50 deg c Cell Constant: Adjustable Sensor: Conductivity Cell Power: 230V +- 10% 50 Hz</p>
5	FT-IR	The Fourier transform infrared spectrometer with personal

	spectrophotometer	<p>computer should satisfy the following specifications:</p> <p>a) Spectral range: 8000 to 350 cm⁻¹</p> <p>b) Detector: Broad band MCT for 12000 – 450 cm⁻¹ and DLaTGS detector for 8000 – 350 cm⁻¹</p> <p>c) Beam Splitter : KBr beam</p> <p>d) Spectral Resolution: Better than 0.4 cm⁻¹ (apodized)</p> <p>e) Wave number Accuracy: Better than 0.01 cm⁻¹ @ 2000 cm⁻¹</p> <p>f) Photometric Accuracy: Better than 0.1% T</p> <p>g) Signal-to-Noise: 7,000:1 or better; peak-to-peak@2000cm⁻¹ ; 4 cm⁻¹ resolution.</p> <p>h) Source: Internal high power IR source</p> <p>i) Interferometer: Rock solid and permanent aligned with high stability.</p> <p>j) A/D converter: True 24 bit dynamic range for all scan velocities</p> <p>k) Spectrometer Input Power: 240V/50Hz</p> <p>l) Spectroscopy Software: A PC-based data system to control the spectrometer optics and signal processing and manipulation A personal computer along with laser-jet printer with duplex option should be supplied with following specification: Motherboard: Intel processor; RAM: >3 GHz , 4GBRAM Hard Disk: 1 TB HDD or better, DVD; Monitor: 21.5” TFT display Ports: USB 3.0,USB,2.0,Ps/2, RJ-45,VGA, PClex16(1), Pcle4(1), pcle1(2), display port; Operating system: windows 7 ultimate or better. Laser jet duplex printer : Monochrome, print speed atleast 33 ppm, Duty cycle (A4,monthly):50000 pages,print technology :laser, duplex printing, Connectivity::USB, power supply:230V/50Hz. Warranty: 1 year, one toner cartridge should be supplied along with the printer.</p> <p>m) Computer Interface: Ethernet connection</p> <p>Specifications: Interferometer: 25 mm, permanently aligned, Michelson, 45°, mechanical flexure; Enclosure: Sealed and desiccated; Spectral range: KBr 8000–350 cm⁻¹, ZnSe 5100– 600 cm⁻¹; Spectral resolution: < 2 cm⁻¹; Wavenumber accuracy 0.05 cm⁻¹; Wavenumber reproducibility: 0.005 cm⁻¹.</p>
6	UV-ViS Spectrophotometer	<p>Optical System : Double Beam with sample and reference cell holder Wavelength Range : 190nm to 1100nm or better</p> <p>Working Mode : PC controlled</p> <p>Spectral Band Width : Fixed or Variable (0.5, 1, 2, 4 or 5nm)</p> <p>Scanning Speed : 3000 nm/min or more</p> <p>Monochromator : Czerny Turner mounting with 1200 lines/mm</p> <p>Wavelength Accuracy : + 0.1nm @656.1nm D2 : + 0.3nm entire range (190 to 900nm or better)</p> <p>Wavelength Repeatability : 0.1nm</p> <p>Stray light : < 0.02% T @ 340 nm for NANO2 < 0.9% T @ 198 nm for KCl</p>

		<p>Photometric Range : -4 to +4 Abs, Transmittance 0-100%</p> <p>Photometric Accuracy: 0.002 Abs (0.5) +₋ 0.004 Abs (0.5-1A) +₋ 0.006% T (2A)</p> <p>Photometric reproducibility: 0.001 Abs (0-.5A) 0.001Abs (0.5-1A) 0.15% T</p> <p>Baseline stability : +< 0.0003 Abs or better Baseline fitness : +- 0.0015 Abs (190-1100 nm) Noise level : 0.00005 Abs RMS @ 800 nm Cuvetts (3.5ml) : One dimensional set of glas and Quartz cuvette (10mm) Detector: Silicon photo diode detector or PMT PC and Printer, Communication through USB, Suitable UPM with 30 min backup Sample: Solid (pelletiser assembly) and liquids (cuvette) both Warranty: 2 years with additional AMC of two years</p>																		
7	Fluorescence Spectrophotometer	<table border="1"> <thead> <tr> <th>Item</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Operation mode</td> <td>Stand-alone or PC operation</td> </tr> <tr> <td>Light source</td> <td>150W Xenon lamp (self-deozonating lamp house)</td> </tr> <tr> <td>Photometric principle</td> <td>Monochromatic light monitoring ration calculation</td> </tr> <tr> <td>Sensitivity</td> <td>800 or more (RMS) (bandpass 5nm, response time 2 S)</td> </tr> <tr> <td>Bandpass</td> <td>2.5, 5, 10, 20 nm (both Ex and Em)</td> </tr> <tr> <td>Wavelength scan speed</td> <td>60 – 3,000 nm/min (four steps), 12,000 (when PC control)</td> </tr> <tr> <td>Dimensions / Weight</td> <td>600 (w) x 503 (D) x 343 (H) mm/ approx.41 kg</td> </tr> <tr> <td>Power consumption</td> <td>AC100, 115, 220, 230, 240 V 50/60 Hz 400 VA</td> </tr> </tbody> </table>	Item	Description	Operation mode	Stand-alone or PC operation	Light source	150W Xenon lamp (self-deozonating lamp house)	Photometric principle	Monochromatic light monitoring ration calculation	Sensitivity	800 or more (RMS) (bandpass 5nm, response time 2 S)	Bandpass	2.5, 5, 10, 20 nm (both Ex and Em)	Wavelength scan speed	60 – 3,000 nm/min (four steps), 12,000 (when PC control)	Dimensions / Weight	600 (w) x 503 (D) x 343 (H) mm/ approx.41 kg	Power consumption	AC100, 115, 220, 230, 240 V 50/60 Hz 400 VA
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8.	Optical Microscope	<p>Illumination: Built in transmitted Koehler illumination 12 V, 100 W long life halogen bulb Light intensity voltage range: 2 V or less to 12 V DC Rated Voltage: 100-120/220-240 V, 50-60 Hz Power Consumption: 140 W Focusing: Stage height movement (up-down, to-fro)</p>																		

		<p>Strok per rotation: 0.1 mm (fine) 17.8 mm (Coarse) Full strok range: 25 mm Upper limit stopper, tension adjustment on coarse focus Revolving Nosepiece: Universal 6 position revolving nosepiece Observation tube: Binocular tube Stage: X and Y axis knobs with adjustable tension Movement Mechanism: 52 mm in vertical and 76 mm in horizontal Specimen holder: Single slide holder Condenser: Objective range: 1X, 4X, 10X, 100X Record of image: 32 Mega Pixel camera Operating Environment: Temp: 5⁰c-40⁰c Humidity: 80%</p> <p>Eyepieces: Spring-locked 10x/20mm focusable eyepieces with dual diopter adjustments, foldable rubber eye guards, anti-fungal coating Head: Binocular or Trinocular viewing tube with 30° viewing angle, 360° rotatable, interpupillary distance adjustment of 48-75mm Objectives: Infinity Plan-Achromatic 4X (0.1 NA/ 30mm WD), 10X (0.25 NA/ 4.82mm WD), 40X (0.65 NA/ 0.62mm WD), 100X (1.25 NA/ 0.11mm WD), all with anti-fungal coating, enable viewing of an assortment of specimens with the highest degree of clarity Stage: Rackless 200x160mm mechanical stage with dual specimen holder and low-drive X/Y movement controls, 78x54mm X/Y travel range Condenser: Abbe 1.25 NA condenser with iris diaphragm Stand: Single mold rust-resistant stand with ergonomic hand rests that provide comfort and stability Focusing: Coarse, 3mm/rotation; fine, 0.3mm/rotation; 12.7mm total</p>
<p>9</p>	<p>Ultrasonicator (Probe Sonicator)</p>	<p>Ultrasonic Processor Model EI-250UP Power: 250 watts (average) - Variable from 60 - 100% Frequency: 20+/-3 KHz. Timer: Digital - (microprocessor based) 0 to 30 mins Meters: Digital Voltmeter. Processing Capacity: 50 ml. to 500 ml</p>

		<p>Power supply: 230 V AC</p> <p>Housing: MS Powder coated housing for Generator and Transducer assembly.</p> <p><u>Accessories:</u></p> <ol style="list-style-type: none"> 1. SS 316 Horn –10 mm -1 No. 2. Stand and Jack arrangement for keeping sample <p>Necessary tools – 1 set.</p>																								
10	Centrifuge (Cooling)	<table> <tr> <td>Speed regulation range for centrifuge tubes</td> <td>100-8000 rpm (1610 × g)</td> </tr> <tr> <td>Speed regulation range for microtitre plates</td> <td>100-2000 rpm (560 × g)</td> </tr> <tr> <td>Setting resolution</td> <td>100 rpm</td> </tr> <tr> <td>Digital time setting</td> <td>1 - 90 min (increment 1 min)</td> </tr> <tr> <td>Timer sound signal</td> <td>+</td> </tr> <tr> <td>Rotor imbalance diagnostics (automatic stop, “IMBALANCE” warning)</td> <td>+</td> </tr> <tr> <td>Display</td> <td>LCD, 2 x 16 signs</td> </tr> <tr> <td>Chamber diameter</td> <td>335 mm</td> </tr> <tr> <td>Overall dimensions (W×D×H)</td> <td>420 x 495 x 235 mm</td> </tr> <tr> <td>Weight</td> <td>11.8 kg</td> </tr> <tr> <td>Nominal operating voltage</td> <td>230 V, 50/60 Hz or 120 V, 50/60 Hz</td> </tr> <tr> <td>Power consumption (230V / 120 V)</td> <td>110 W (0.5 A) / 120 W (1 A)</td> </tr> </table>	Speed regulation range for centrifuge tubes	100-8000 rpm (1610 × g)	Speed regulation range for microtitre plates	100-2000 rpm (560 × g)	Setting resolution	100 rpm	Digital time setting	1 - 90 min (increment 1 min)	Timer sound signal	+	Rotor imbalance diagnostics (automatic stop, “IMBALANCE” warning)	+	Display	LCD, 2 x 16 signs	Chamber diameter	335 mm	Overall dimensions (W×D×H)	420 x 495 x 235 mm	Weight	11.8 kg	Nominal operating voltage	230 V, 50/60 Hz or 120 V, 50/60 Hz	Power consumption (230V / 120 V)	110 W (0.5 A) / 120 W (1 A)
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11	Keithley Multimeter (SMU-2450, 6517B)	<p>SMU-2450</p> <p>0.00000mV to 200.0000V voltage, 10.00000nA to 1.000000A current measurement</p> <p>Capabilities of analysers, curve tracers and I-V systems at a fraction of their cost</p> <p>Five inch, high resolution capacitive touchscreen GUI, maximum output power of 20W</p> <p>0.012% basic accuracy, listed to UL61010-1 and UL61010-2-30,</p>																								

		<p>0 to 50°C operating temperature</p> <p>Enhanced sensitivity with new 20mV and 10nA source/measure ranges</p> <p>Source and sink (four quadrant) operation, built-in, context sensitive front panel help</p> <p>Four quickset modes for fast setup and measurements, GPIB, USB 2.0 and LXI/Ethernet interfaces</p> <p>Front panel USB memory port for storing data, programming, instrument configurations, and to upgrade the unit</p> <p>2450 SCPI and TSP scripting programming modes, 2400 SCPI compatible programming mode</p> <p>106 x 255 x 425mm, 4.04Kg weight with bumpers</p> <p>Front panel input banana jacks; rear panel input triaxial connections</p> <p>Front panel USB memory port for storing data, programming, instrument configurations, and to upgrade the unit</p> <p>For a limited time period, FREE Kickstart software with this test equipment - Simply add voucher code: KICKPROM to your order</p> <p>6517B</p> <p>Ranging Automatic or manual.</p> <p>Conversion Time Selectable 0.01 PLC to 10 PLC.</p> <p>Maximum Input 250 V peak, DC to 60 Hz sine wave; 10 sec. per minute maximum on mA ranges.</p> <p>Maximum Common Mode Voltage (DC to 60 Hz sine wave) Electrometer, 500 V peak; V Source, 750 V peak.</p> <p>Isolation (Meter COMMON to chassis) >10 10 Ω, <500 pF.</p> <p>Input Connector Three lug triaxial on rear panel.</p> <p>2 V Analog Output 2 V for full range input. Non-inverting in Volts mode, inverting when measuring Amps, Ohms, or Coulombs.</p> <p>Output impedance 10 kΩ.</p> <p>Preamp Output Provides a guard output for Volts measurements. Can be used as an inverting output or with external feedback in Amps and Coulombs modes.</p> <p>External Trigger TTL compatible External Trigger and Electrometer Complete.</p> <p>Guard Switchable voltage guard available.</p> <p>Digital I/O and Trigger Line Available, see manual for usage.</p> <p>EMC Conforms to European Union Directive 89/336/EEC, EN 61326-1.Safety Conforms to European Union Directive 73/23/EEC, EN 61010-1.</p> <p>Reading Storage 50,000.</p>
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12	PCR	<p>Input Power: upto 700 W Frequency: 50-60 Hz Single Phase Display: LCD Ports: 4 USB A, 1 USB B Fuses: Two 10 A, 250 V, 5x20 mm Memory: > 1000 typical programs onboard Dimensions: 33X34X20 cm Weight: 10 Kg\ PC Compatibility: Window XP or higher PCR License: Yes</p> <table border="0"> <tr> <td>Reaction Modules:</td> <td>96- Well Fast,</td> <td>96-Deep Well</td> </tr> <tr> <td>Sample Capacity</td> <td>96X 0.2 ml tubes</td> <td>96X0.2 ml tubes</td> </tr> <tr> <td>Max ramp rate</td> <td>5⁰c/sec</td> <td>2.5⁰c/sec</td> </tr> <tr> <td>Average ramp rate</td> <td>3.3⁰c/sec</td> <td>2⁰c/sec</td> </tr> <tr> <td>Temp Range</td> <td>0-100⁰c</td> <td>0-100⁰c</td> </tr> <tr> <td>Temp Accuracy</td> <td>+₋ 0.2⁰c</td> <td>+₋ 0.2⁰c</td> </tr> <tr> <td>Temp Uniformity</td> <td>+₋ 0.4⁰c</td> <td>+₋ 0.4⁰c</td> </tr> </table> <p>Gradient range: 30-100⁰c Temp Differential: 1-24⁰c</p>	Reaction Modules:	96- Well Fast,	96-Deep Well	Sample Capacity	96X 0.2 ml tubes	96X0.2 ml tubes	Max ramp rate	5 ⁰ c/sec	2.5 ⁰ c/sec	Average ramp rate	3.3 ⁰ c/sec	2 ⁰ c/sec	Temp Range	0-100 ⁰ c	0-100 ⁰ c	Temp Accuracy	+ ₋ 0.2 ⁰ c	+ ₋ 0.2 ⁰ c	Temp Uniformity	+ ₋ 0.4 ⁰ c	+ ₋ 0.4 ⁰ c
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13	Ultra deep Freezer (-80 ⁰ c)	<ul style="list-style-type: none"> ○ Freezer should be of 550 to 580 Liters capacity ○ System should have Programmable operating temperature from 																					

		<p>-50°C up to -86°C with 1°C increment</p> <ul style="list-style-type: none"> ○ Fully programmable microprocessor controlled with membrane keypad and eye level control panel. ○ Construction should be of Polyurethane foam insulation. ○ System should be made up of 18 gauge Steel, 1.2 mm thick with powder coated paint to resist scratch and rust and the interior should be Polished with 304 SS for easy cleaning and to eliminates potential for oxidation. ○ Inner door should have silicone seal to prevent temperature loss and Outer door should have safe silicone triple point seal ○ Freezer should have 5 Compartment with five inner doors. ○ Ambient to -85 C pull down timing should be 5.1hrs ○ Freezer should have the sample (2" vials) capacity of 40,000 or more. ○ Freezer should be supplied with One Shelf's loaded with Racks and 2" cardboard boxes. ○ Freezers should have heated air vent and front panel air filter. ○ Should have security keyed locks on the outer doors and lids keep out unauthorized users ○ Freezer must have battery back-up and 4 PIN security lock for unauthorized tampering. ○ Freezer must have RS 485 interface data logging port and it must also have on board diagnostic software. ○ Freezer must have three compartments with three inner doors for easy handling of samples. ○ Audible and visible alarms for temperature, power failure, system failure, battery low etc. and it also have remote alarm port for connection to an auto dialer. ○ Freezer must use CFC-FREE, HCFC-FREE non flammable refrigerants, and refrigeration system must be energy efficient and hermetically sealed two stage cascade refrigeration system. ○ Compressor should be capable to run any voltage between 190 – 270V. ○ Freezer must have ISO 9001 standard quality test requirements and IEC 61010 Electrical safety CE & UL certified. ○ Freezer must have capacity to hold 16 racks and 400 boxes of 2" height vials ○ Freezer should have electric supply of 230v/50hz, 10 amps and ○ Power Consumption should not more than 10.5 -11kWh/day . ○ Heat Output should not more then 438-440W. ○ Freezer should be supplied with 5KVA voltage stabilizer. ○ Freezer should be supplied with Factory calibrated certificate and IQ,OQ, PQ should be provided. ○ Theses accessories should also be supplied - liquid nitrogen cylinders (5 lts, 10 ltr and 20 ltr one each), cryo gloves (3pairs), cryoboxes (5), coolpacks (20)
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14	Gel Electrophoresis	Specifications for Electrophoresis Apparatus with Accessories Horizontal gel apparatus: 18 – 20 cm (Length) x 25 – 30 (Breadth) x 5- 7.5 cm (Height), 40-60 samples, multichannel pipette compatible combs and gel caster. Vertical gel apparatus: 10 – 12 cm (Length) x 8 – 10 (Breadth) x 8 - 12 cm (Height), 5-10 samples, glass plate (10 x10 cm), comb capacity of 35µl -50µl and gel caster. Gel imaging system with UV transilluminator (white light and UV light), built in with 5MP – 10MP camera; 1D Gel analysis Soft-ware. Power pack (output 10 – 300 V) with output terminals, timer, 3 digit LED display and start/stop function.
15	Microtome	<ul style="list-style-type: none"> ○ Specimen advance 1 to 30 µm in 1 µm steps ○ Integrated, smooth hand wheel that locks in any position ○ Fine orientation of specimen with specimen tilt ○ Quick change for all specimen clamps ○ Option to use both standard knife holder and disposable blade holder ○ Section Waste tray ○ Knife holder takes knives from 110 to 185 mm long by 28 to 35 mm wide and has guards for protection both inside and outside clamp ○ Standard accessories to include the following: Object orientation set, Universal Cassette Clamp, universak knief holding base, Std knief holdr,sharp blade holder, Waste tray, Dust cover, 50 each low and high profile disposable Microtome blades. ○ Automatic and manual operation.
16	Digital Autoclave	<p><u>Measurement variables</u>: heat of combustion, gross calorific value of solid, liquid fuels and propellants</p> <p><u>Scope of application</u>: hydrocarbon liquid fuels,solid fuels, cellulosic fuels, biomass, plastics, propellants (example: HTPB + ammonium perchlorate, nitro-glycerine + nitrocellulose), laboratory education</p> <p><u>Analysis type</u>: isoperibol, adiabatic or dynamic that allows measurements from equipment to conform to ASTM D240-02, D4809-00, E144-94, D5865 and other equivalent methods</p>

		<p><u>Measurement units:</u> J/kg, cal/gm, BTU/lb</p> <p><u>Temperature resolution:</u> 0.0001°C or better</p> <p><u>Combustion Bomb:</u> Halogen and acidresistant stabilized stainless steel</p> <p><u>Resolution:</u> 0.001 kcal/gm or better</p> <p><u>Relative standard deviation:</u> 0.1% or better</p> <p><u>Measurement range:</u> up to 40,000 J/gm</p> <p><u>Crucible type:</u> corrosion resistant alloy or quartz</p> <p>The equipment should also be compact table top, operable standalone (without PC and software).The equipment should have a display (touch screen is preferred) of results in standalone operation (Optional: upgradeable to a software controlled system).In stand-alone mode the equipment should be operable manually (for education) or in automatic mode. In automatic mode calculation and display of calorific values should be automatic.In-built data storage capability for previous analyses and provision for transferring data to PC or media is preferred.</p> <p>Oxygen/gas filling and water filling may be manual, semi-automatic or automatic. The unit may be with or without chiller unit</p> <p><u>Analysis time per sample:</u> 15 to 30 minutes or lower</p> <p>Power supply: 230 V, 50/60 Hz</p>
17	Incubator	<p>Should be operated on 230V,50Hz single phase AC supply, and having temperature ranging from ambient to 60°C 2. Should be double walled with stainless steel inner chamber having a minimum of two inner stainless steel shelves with holes and powder coated outer surface. 3. Inner chamber should be fabricated with ribs for adjusting shelves to convenient height. 4. Should have a minimum of chamber size of (L*B*H) of 450*450*450mm. 5. Should be provided with three side heating elements. 6. Should have air circulating fan (Which can be turn ON/OFF on demand) for uniform temperature on all shelves. 7. Should have double door with acrylic transparent door. 8. Should provide with a microprocessor based digital temperature controller with digital display. 9. Should have synthetic rubber gasket at the door.</p>
18	Laminar Air Flow	Laminar Cabinets Inner Chamber & Outer Chamber made of

		stainless steel high efficiency particular air filters, to achieve the air purification upto 0.3 Microns in Working area. Working area 4 ft x 2 ft x 2 ft Blower fitted with ¼ HP Motor, with RPM 1200 to 1400. Pre-filters made of high grade nylon Net fixed in S.S. frame for first Stage air purification, through blower system. Closed Inner Chamber fitted with HEPA having very accurate performance rate of air filtration, rated 99.99%, resulting in ceasing all air bore molecule of particle upto 0.3 micron in working Area of Laminar Bench. Working area of Laminar Airflow Cabinets illuminated by fluorescent light ;cabinets operated at 230V. Single Phase 50Hz. AC Supply. Fitted with UV Germicidal lamp for sterilization. Fitted with Acrylic Front Door sliding type Fitted with Manometer for Measurment of HEPA Filters Choking system. Fitted with Cock for Gas Connection
19	Spin Coater	Type: Precision controlling through micro controller. Speed range: 100 RPM to 10000 RPM. <ul style="list-style-type: none"> ○ Accuracy : < ±1% error across the full range Working Chamber : PTFE coated ○ Power Supply : 230 V/AC, 50 Hz ○ Vacuum Suction : Integrated Vacuum release switch ○ Protocol Setting : Dial Knob ○ & Buttons Display: Real-time display of R.P.M. ○ & Time Acceleration : 2000rpm/sec (Constant) ○ Wattage : 150W
20	Digital Weighing Machine	Specification : Tuning-fork frequency sensing Measuring system, Tare Full weighing range , LCD with back-light (height 16.5mm) Range: upto four digit Max Weight: 500 gm Min: 0.001mg
21	Vacuum Pump	Make - HindVac/IR Type - Oil lubricated. • Gas Service - Vacuum • Tank Capacity - 1000 Ltrs (Either Built in or External) • Flow Capacity - 300 Nm ³ /hr • Vacuum Level - 10 – 20 Torr • Ultimate Pressure - 0.5 mbar (0.375 Torr) • Motor Rating - 415V +/-10 %, (3 Phase) 50Hz, IP 55, Insulation class F • Motor Power - 6 KW • Motor Speed - 1500 min ⁻¹ • Noise Level - 72 dB (A) • Oil Capacity - 7 Lit. • Water vapour capacity - 3.6 kg/hr • Water vapour tolerance - 30mbar Vacuum Pressure Gauges : Material Of Construction : SS 304/ 316 Make : WIKA/ Warea / Gauges Bourdon Size : 100 mm Dial and 2.0 or 2.5 “ Dial size Range : 0 to -760 Torr
22	Fume Hood	Fume Hood superstructure : 18 gauge CRC Sheets, Electrode position Powder coated 80-100 micron Table top : 32 mm Jet Black Granite Table top Electrical sockets : PVC Gas fixtures : Brass Lacquer Coated

Internal piping : SS304
Vacuum Fixtures : Brass Lacquer Coated
Water fixtures : Brass Lacquer Coated
Electrical cables : Copper wire with PVC Sheath

Fume Hood Superstructure Frame

Free-standing rigid frame structure of steel angle shall be provided to support exterior panels and interior liner and baffle panels. To allow for maintenance and replacements, the interior liner panels shall be removable without disassembly of the frame structure and outer steel panels. Likewise, the exterior steel panels shall be removable without disassembly of the frame structure and inner liner panels. Fume hoods that require disassembly of the superstructure for liner replacement are not acceptable.

Fume Hood Interior Walls:

Double wall ends, not more than 4" wide, shall be provided to maximize interior working area. The area between the double wall ends shall be closed to house the remote control valves. The front vertical fascia section shall have a full 135 degree 1" radius at the front leading edge to provide a streamlined section and insure smooth even flow of air into the hood. The vertical facias shall contain the required service controls, electrical switches and receptacles. The hood interior end panels and sash track shall be flush with the fascia to prevent eddy currents and back flow of air.

Fume Hood Air foil:

A streamlined airfoil shall be integral at the bottom of the hood opening on bench and distillation hoods. This foil shall provide a nominal 1" open space between the foil and the top front edge of the work surface to direct an air stream across the work surface to prevent back flow of air. The airfoil shall extend back under the sash, so that the sash does not close the 1" opening. The foil shall be removable to allow large equipment into the hood. The foil shall be of 12-gauge steel to resist denting and flexing. Walk-in hoods shall have a stop located at the bottom of the sash track that will ensure a nominal 1" opening between the bottom of the sash and the floor.

Fume Hood Top Panel:

Restricted Bypass Configuration:

The top front panel shall be of the same material as the exterior fascia.

		<p>Fume Hood Baffles :</p> <p>A stable, non-adjustable baffle with three fixed horizontal slots shall be provided to aid in distributing the flow of air into and through the hood. The baffle shall be spaced out 2-1/4” from the back liner. The baffle shall be removable for cleaning</p> <p>Fume Hood Duct Collar:</p> <p>A 12” diameter polyethylene bell-mouthed duct collar shall be located in the top of the hood plenum chamber. Coated common steel duct collars are not acceptable.</p>		
23	Hall Effect	<p>1.Hall probe (Ge:p type, n-type) 2. Oven 3. Temperature sensor 4. Hall Effect Set-up, Model : DHE-22 5. Electromagnet, EMU-50V 6. Constant Current Power Supply, DPS-50 7. Digital Gaussmeter, DGM-102,</p> <p>(a) Digital Millivoltmeter: Intersil 3½ digit single chip ICL 7107 have been used. Since the use of internal reference causes the degradation in performance due to internal heating an external reference have been used.</p> <p>Digital voltmeter is much more convenient to use in Hall Experiment, because the input voltage of either polarity can be measured. Specifications Range : 0-200mV (100µV minimum) Accuracy : ±0.1% of reading ± 1 digit</p> <p>(b) Constant Current Power Supply: This power supply, specially designed for Hall Probe, provides 100% protection against crystal burn-out due to excessive current. The supply is a highly regulated and practically ripple free dc source. Specifications Current : 0-20mA Resolution : 10µA Accuracy : ±0.2% of the reading ±1 digit Load regulated : 0.03% for 0 to full load Line regulation : 0.05% for 10% variation Input Supply : 220VAC ±10%</p>		
24	Zeeman Effect	Optical Bench	1	
		○	Transverse saddle	3
		○	Convex lens in holder 5cm & 10cm	2
		○	Polarizer filter	1
			Quarter wave filter	1
		○	Electromagnet	1
		○	Power supply for electromagnet	1
			Mercury lamp with supply	1
		○	Mercury lamp holder	1
		○	Fabry-Perot etalon	1

		<ul style="list-style-type: none"> ○ USB camera ○ Digital Gauss meter ○ Color filter with holder ○ Micrometer Eyepiece 	1 1 1
		<p>Electromagnet Coils: 500 turns. Coil Current: 5Amp (Max.) Connection: 4mm safety socket. U Core: 150x130mm(LxH), 40x40mm cross section. I Core: Length=150mm, 40x40mm cross section. Core material: Ferromagnetic. with 4 support legs with leveling knob.</p> <p>Optical bench Material: Aluminium alloy Type: Hexagonal section Scale: 0-100cm Least count: 1m</p> <p>Power Supply Input Voltage: AC 220V $\pm 5\%$ Output Voltage: 0-30V Output Current: 0-5Amp Voltage Display: 3½ Digit LED Current Display: 3½ Digit LED</p> <p>Polarizable Filters Angle: Adjustable (0°-90°) Aperture: 21mm dia. Frame: 130mm dia., to avoids scattering of lights Rod: 10 mm dia.</p>	
25	Laser Kit (Solid state LASER kit)	<p>Pump laser diode with Peltier cooler and attached pump optics • Laser diode driver & thermoelectric controller LDD1-1T (optional: LPS1-2T, microprocessor-controlled) • Laser crystal Nd:YAG (Nd:YVO₄ optional), with a heat sink • Set of two laser cavity mirrors (flat/curved) • Cr⁴⁺:YAG passive Q-switch, AR/AR coated • KTP frequency doubler with special coatings, in a holder • Mirror and crystal mounts (3 pieces) • Optical bench • Diode laser module (670 mm) for aligning the laser cavity, with holder • Infrared-to-visible converter (model IR-VIS-15-B), Ø 15 mm, for aligning the IR laser and mode analysis (also suitable for high-power lasers) • Ultrafast photo detector (model UPD-300-SP) with rise time</p>	
26	Truss-Tube Telescope (Sky	<p>Optical Design: Dobsonian Primary Aperture: 458 mm (18")</p>	

	watcher)	<p>Secondary Diameter: 120 mm minor axis Secondary Obstruction by Area: 7% Mirror Coatings: 94% aluminum Glass Type: Borosilicate Focal Length: 1900 mm Focal Ratio: f/4.1 Light Gathering: 27% above a 16" telescope Eyepiece Height at Zenith: 74.5" Rayleigh Limit: 0.31 Dawes Limit: 0.25 Limiting Magnitude: 15.9 Minimum Magnification: 65x Maximum Magnification: 902x Focuser: 2" dual-speed Crayford Included Eyepieces: 10 mm, 28 mm LET Included Finder: 9x50 Counterweights: (3) 2.3 lbs. Other Included Items: Shroud, truss clamps Upper Cage Weight: 11 lbs. Truss Pole Weight: 2.6 lbs. each, 16 lbs. total Mirror Box Weight: 62 lbs. Dobsonian Base Weight: 40 lbs. Fully Assembled Weight (with Counterweights): 129 lbs</p>
27	Vacuum Oven	<p>Pressure Control System: PID Temp Range: +-40- 200⁰c Temp Constancy: +=0.5⁰c Pressure range:” 10⁻² torr Pressure recovery: with in 15 min Exterior material: Steel with baked finish Vacuum chamber: SS Heater: Mica Inlet: ¼ inch, Effective internal volume: 90 litre Rotary pump: 220 VAC, 200 litre/min, Power Supply: 220 VAC, 14.2 Amp, Time to reach extreme temp: within 30 min</p>
28	COD Digestor	<p>Temp Range: above or upto 180⁰c Resolution: 1⁰c Display: GDigital 12 mm, RED LED Control: Digital Electronic Temperature Heater Rating: 750 watts Sensor: PT-100 Timer: Selectable 15, 30,45, 60, 90 Hole Size: 40 mm dia X 80 mm deapth</p>

		<p>Glass Tube: 38 mm diaX 15 nos (5X3 rows) Sample Volume: 20 ml each Dimension: 500 W X 270 D X 210 mm Inner Block: Aluminium made Outer Body: M.S. Powder Max Temp: 5⁰c Rating watts: 500 watts</p>
29	Autoclabe	<ol style="list-style-type: none"> 1. Chamber volume should be 90-100 liters. 2. It should operate with saturated steam under pressure of 15 to 22 PSI (adjustable). 3. It should have sturdy double wall construction with boiler made of stainless steel at least 16 gauge sheet. 4. Should provide heat resistant SILICON door gasket withstand upto 140 Deg. C. 5. Outer shell should also be made of stainless steel. 6. Stand shall be made of Mild steel with anticorrosion paint. 7. Boiler and outer shell should be provided with air insulation. 8. Lid should be made of steel sheet and tightened by radial locking. 9. Joint-less gaskets should be made of Neoprene rubber. 10. Sterilizer should be fitted with water level arrangement to indicate water position inside the boiler. 11. Pressure gauge, air/steam release cock and two safety valvesshould be provided. 12. It should have immersion type heating element 13. It should be supplied withcord and plug to work on 220 Volts 50 cycles A.C. supply. 14. Safety features of sterilizers: Doorlocking facility, Low water protection system, Pressure cut off facility and all other necessary safety features. 15. The sterilizer should be fitted with suitable PLC (Microprocessor) for fully automatic cycle operation instead of manual operating valve with digital displays of Chamber Pressure, temperature etc.
30	Digital Bomb Calorimeter	<p><u>Measurement variables:</u> heat of combustion, gross calorific value of solid, liquid fuels and propellants</p> <p><u>Scope of application:</u> hydrocarbon liquid fuels,solid fuels, cellulosic fuels, biomass, plastics, propellants (example: HTPB + ammonium perchlorate, nitro-glycerine + nitrocellulose), laboratory education</p> <p><u>Analysis type:</u> isoperibol, adiabatic or dynamic that allows measurements from equipment to conform to ASTM D240-02, D4809-00, E144-94, D5865 and other equivalent methods</p>

		<p><u>Measurement units:</u> J/kg, cal/gm, BTU/lb</p> <p><u>Temperature resolution:</u> 0.0001°C or better</p> <p><u>Combustion Bomb:</u> Halogen and acidresistant stabilized stainless steel</p> <p><u>Resolution:</u> 0.001 kcal/gm or better</p> <p><u>Relative standard deviation:</u> 0.1% or better</p> <p><u>Measurement range:</u> up to 40,000 J/gm</p> <p><u>Crucible type:</u> corrosion resistant alloy or quartz</p> <p><u>Analysis time per sample:</u> 15 to 30 minutes or lower</p> <p>Power supply: 230 V, 50/60 Hz</p>
31	LCD Projector	Epson EB-990U :- 3LCD, Front, Resolution: Min 1920 X 1200, WUXGA, Brightness (Minimum): 3800 ANSI Lumens for Color light output 3800 ANSI Lumens for White light output , Contrast Ratio (Minimum): 15000:1, Aspect Ratio: 16:10, Lamp Type: UHE, Lamp Life Min. 6000 Hrs. Normal mode and 12000 hrs. Echo Mode ,Remote control bundled, Input/output Mode VGA in / VGA Out, 1 HDMI, USB (Type A & B) / WiFi Optional / LAN, 2 Years on Projector and 1 Year or 1000 hours on lamp
32	Xenon Server online UPS	Eaton 9E IN 3000XL Online UPS, 42Ah*8 no's battery for 2 hours back up,UPS Mounting Rack
33	Zerox Photocopier	Epson WF-C5790, Epson WF-C579R
34	PCs (Lenovo)	M720 Tower M720 TW B360/I5-9500/8GB DDR4 Single slot (DDR4 2666)/4DIMM Slots/1TB/NoODD /No OS/85%Efficiency/3 Video Ports (VGA+2DP), 64 GB Expandable/ 4DIMM Slots/ Serial Port/ 4 USB 3.1Port & 4 USB2.0 Ports/19.5Monitor 3-year onsite warranty
35	QuarkXPress Graphic softwre	<p>Mac OS X® 10.11.6 (El Capitan), macOS® 10.12.6 (Sierra), macOS® 10.13.x6 (High Sierra) and macOS® 10.14.x (Mojave)</p> <p>Hardware</p> <p>CPU with dual cores or more 4GB RAM available for QuarkXPress 2GB hard disk space for installation</p> <p>Software</p> <p>Microsoft® Windows® 7 SP1 (64 Bit), Windows® 8.1 with April 2014 update rollup update (KB2919355) and March 2014 servicing stack update (KB2919442) (64 Bit) or Windows® 10 Version 1709 (64 Bit) or later, Microsoft .NET Framework 4.0 or later</p>

36	Incubator (BOD)	<table border="1"> <tr> <td>External Chamber</td> <td>MS / SS 304 / SS 316</td> </tr> <tr> <td>Internal Chamber</td> <td>Stainless Steel 304 (Optional SS 316)</td> </tr> <tr> <td>Volume</td> <td>200 litre</td> </tr> <tr> <td>Temperature Range</td> <td>2°C to 60°C</td> </tr> <tr> <td>Temperature Uniformity</td> <td>+/- 0.5°C at 20°C</td> </tr> <tr> <td>Display</td> <td>Backlit LED Display</td> </tr> <tr> <td>Temperature control</td> <td>Microprocessor P.I.D controller On / Off compressor control PT 100 sensor</td> </tr> <tr> <td>Door</td> <td>Solid insulated door (with glass & without glass) w/ lock</td> </tr> <tr> <td>Shelves</td> <td>Stainless steel Shelves (2 to 5), removable</td> </tr> <tr> <td>Refrigerant</td> <td>R134a / CFC Free</td> </tr> <tr> <td>Power</td> <td>220 Volts</td> </tr> <tr> <td>Optional</td> <td>Caster wheels Humidity system Light system by interior illumination w/ 3 fluorescent tubes Timer 0-24 hours for regulating cycle's illumination condition Arrangement for incubation of CO2 Air Mixture Combined Electronic Digital Temperature & humidity controller Automatic Voltage Stabilizer of 3 KVA Certifications (IQ / OQ / DQ / PQ)</td> </tr> </table>	External Chamber	MS / SS 304 / SS 316	Internal Chamber	Stainless Steel 304 (Optional SS 316)	Volume	200 litre	Temperature Range	2°C to 60°C	Temperature Uniformity	+/- 0.5°C at 20°C	Display	Backlit LED Display	Temperature control	Microprocessor P.I.D controller On / Off compressor control PT 100 sensor	Door	Solid insulated door (with glass & without glass) w/ lock	Shelves	Stainless steel Shelves (2 to 5), removable	Refrigerant	R134a / CFC Free	Power	220 Volts	Optional	Caster wheels Humidity system Light system by interior illumination w/ 3 fluorescent tubes Timer 0-24 hours for regulating cycle's illumination condition Arrangement for incubation of CO2 Air Mixture Combined Electronic Digital Temperature & humidity controller Automatic Voltage Stabilizer of 3 KVA Certifications (IQ / OQ / DQ / PQ)
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38	Noise level meter	<p>Measuring range: 25 ... 136 db(A) LXY (SPL), Leq (LXeq), LXYSd, LXSEL, LXE, LXYmax, LXYmin, LXPeak, LXN Frequency weighting: A, B, C and Z Time weighting: Fast (125 ms), slow (1 sec) and impulse (35 ms), decay (1500 ms) adjustable data-recording interval from 1 s ... 24 h 1/1 octave band filter (optional 1/3 octave band filter upgrade) Automatic range: 30 ... 130 dB Manual range: 30 ... 80 / 50 ... 100 / 80 ... 130 dB Resolution: 0.1 dB Accuracy: ±1.4 dB Memory capacity: 32700 values</p>																										
39	Weather Station	<p>Units °C (Temperature) Range -40°C to + 120°C Resolution 0.01°C Accuracy +/- 0.3°C</p>																										

		<p>Excitation Voltage 3.3 V Solar Radiation Units W m² (Power) Range 0-1750 W m² Resolution 1 w m² Accuracy 1 w m² Excitation Voltage None Passive Humidity Units RH% (Humidity) Range 0-100% Resolution 0.05% Accuracy ± 2% Excitation Voltage 3.3 V Quantum PAR Units μmol m⁻²; s⁻¹ Range Full Sunlight 2,000 μmol m⁻² s⁻¹ Resolution 2 μmol m⁻² s⁻¹ Accuracy 2 μmol m⁻² s⁻¹ Excitation Voltage None Passive Wind Direction Units Degrees (°) (Rotation) Range 0 to 360° Resolution 1° (0 to 355°) Accuracy 7° Excitation Voltage None Passive Rainfall Units mm Range 0-500 mm/hr</p>
40		