

8. Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
1	<p>Baking Oven</p> <p>Branc: Binder Temperature distribution _ Perfact and ecise</p> <p>Accura e drying ctambers: Controller with LCD Display</p>
2	<p>PH Meter</p> <p>PH Range-2.08 to 16.00 PH</p> <p>PH Resolution 0.01 PH</p>
3	<p>Cooling crystallation</p> <p>Stirrer Tank Approx 25L for Understand Solution; approx 25L</p> <p>Heating circuit Approx 32 L</p> <p>Pump Solution MAX:</p>
4	<p>Kjeldahl Digestion,</p> <p>Places : 6 Place x 250 ml , Temperature Range: Ambient to 4500</p> <p>C Power Supply : 230 V, Power: 1100 W,</p>
5	<p>Water bath</p> <p>Environmental Temperature : Range: 5 C to 40 C , Size ; Bath Inner(WxDxH) 450x300x200 mm ,Overall (WxDxH) (510x360x375)mm Capacity: 27L,</p> <p>lid :Stainless Steel, Power Surce: AC 220 V</p>

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1	2
6	<p>Overhead stirrer</p> <p>Stirring Quantity (H-20L, Motor Type Brushless DC - Motor input power 60 w , Motor Output Power 50W Voltage 100-240 V , 50/60 HZ, Speed Range : 50 -2200 mm</p>
7	<p>Magnetic stirrer with hotplate</p> <p>Materail : Technopolymer Structure, Heating Plate : Ceramic Material ,dimensions of the heating Plate:180x180 mm(7.9x7.9in), Protection rating CEI EN 60529:IP42, display</p>
8	<p>Venchtop Conductivity Meter</p> <p>Rssolution : 0.05 % F.S , Accuracy: ± 0.6 FS ; $\pm 1.5\%$ > 18.0 MS/CM, Reftemp; 15 -30 C</p>
9	<p>Moisture Balance</p> <p>Reacbility Moisture Content : 10 MG/0.1%, Pan Size : 3.5 in(90mm)</p>
10	<p>Filtering Kit with Vacuum Pump, 2000 mm</p> <p>Borosilicate Glass Filter Flask, Bucher funnel Porcelain, 110mm.</p>

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1	2
11	<p>Handheld Alcohol Meter</p> <p>Measuring Range : Alcoh: 0% V/V to 100% V/V Temperature 5 C – 30 C, Ambient Temperature 0 C – 35 C, Power Supply</p>
12	<p>Potable Density Meter</p> <p>Temperature: 0 C – 40 C , Viscosity 0 to 1000 , mpas, Accuracy Density 0.001 G cm³, Solution : Density 0.001 G Cm³</p>
13	<p>Ultrasonic DU series</p> <p>Heated Dimensions(hxdxw):365x385x546 mm working Capacity : 28 Liters</p>
14	<p>Lab Refrigerator</p> <p>Type : Chesttype, Temperature Range: -10 C to - 45 C, exit dimensions (WxDxH) 2180x790x1030mm , Int, dimension ((WxDxH) 1470x500x670mm ,</p>
15	<p>UV -Vis-Spectrophotometer</p> <p>double Beam , Lamp : Deuterium/ Tungstem , Bandwidth 1 nm,deteator: dual Solid statesilicon Photodiode Photometric Ranga : -4.000 A to 4.000A</p>

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
16	<p>Ball Mill</p> <p>-RETSCH, - PM 200</p> <p>PM 200 type for 220-230 V, 50/60 Hz, special design for Mechanical Alloying adjusted speed ratio 1 : -2</p> <p>Field of application : pulverizing, mixing, homogenizing, colloidal milling, mechanical alloying</p> <p>Feed material : soft, hard, brittle, fibrous – dry or wet</p> <p>Feed size : <4 mm</p> <p>Final fineness : <1μm , For colloidal grinding : <0.1μm</p> <p>Batch/Sample volume : max. 2 x 50 ml</p> <p>No. of grinding stations : 2</p> <p>Speed ratio : 1: -2</p> <p>Sun wheel speed : 30 – 400 min⁻¹</p> <p>Max. speed of the jars : 1300 min⁻¹</p> <p>Nominal Power : 750 W</p>
17	<p>Atomic Absorption Spectrophotometer (AAS)</p> <p>- PerkinElmer Set</p> <p>- PinAAcle 900 H</p> <p>PinAAcle 900 H have Flame AAS & Graphite Furnace</p> <p>AAS have D2 background & 8 lamps turrets included</p> <p>Furnace Cooling System and AS900 Graphite Furnace</p> <p>Autosampler AA Syngistix Software Kit</p> <p>3 EDL Lamps and 9 HCL Lamps</p>

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1	2
18	<p>Digital balance</p> <ul style="list-style-type: none">-PX 224-OHAUS <p>Maximum Capacity : 220 g USA Set</p> <p>Readability : 0.0001 g</p> <p>Pan Size : 90 mm</p> <p>Auxiliary Display Model : Available as an Accessory</p> <p>Dimensions (HxLxØxW) : 309 mm x 321 mm x 209 mm</p> <p>Display : 2-Line LCD with Backlight</p> <p>In-use cover : Included</p> <p>Minimum Weight (USP, 0.1%, typical) : 200 mg</p> <p>Net Weight : 10 lb (4.5 kg)</p> <p>Pan Construction : Stainless Steel</p>

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1	2
19	<p>COD Measurement System</p> <ul style="list-style-type: none">- ECO8- Velp <p>CONSTRUCTION MATERIAL: Epoxy painted metal structure</p> <p>MODELS:</p> <p>ECO 8: 8 pos. (Ø16 mm) + 1 pos. (Ø22 mm)</p> <p>SET TEMPERATURE: display visualization</p> <p>COUNTDOWN: display visualization</p> <p>END OF THE CYCLE: acoustic signal with automatic switch-off</p> <p>POWER: ECO 8 140 W</p>

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
20	<p>Rotary Evaporator</p> <ul style="list-style-type: none">- Hahn Shin- HS-2005V-N <p>Glass type : Vertical condenser</p> <p>6 type of flasks ranging from 50ml to 3,000ml</p> <p>Evaporator is equipped with speed control, and R.P.M. value is displayed in digital.</p> <p>When the water level goes down, power will be cut off automatically by sensor.</p> <p>Continuous supply device for large capacity.</p> <p>Flask size : 50 ~ 3000ml</p> <p>Rotation speed : 20 ~ 280 rpm</p> <p>Bath size : Ø245 x 120(H)</p> <p>Capacity : 3.5L</p> <p>Water level sensor : Magnetic type</p>

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1	2
21	<p>Potable Gas Analyzer</p> <ul style="list-style-type: none">- Aeroqual- AQM 65 <p>Real-time measurement of common pollutants to WHO air quality standards</p> <ul style="list-style-type: none">• Can be installed by one person in less than 30 min.• Compact size creates new possible monitoring locations• Remote data acquisition system with fail safe on board storage• Network mode for urban and national air monitoring• Modularity allows addition of sensors as needs change• Temperature control permits long-term operation in extreme climates• Can be calibrated onsite to traceable reference
	<ul style="list-style-type: none">• Optional integrated and automatic calibration• Optional plug and play environmental sensors

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
22	<p>Coating Thickness Gauge</p> <ul style="list-style-type: none"> - CG-100 - Elconometer <p>Range of display & measurement options: Pulse-Echo, Echo-Echo, Pulse-Echo Temp, Comp Mode (PETP), Coating Only Mode (CT), Pulse-Echo Coating Mode (PECT)</p> <ul style="list-style-type: none"> • Adjustable gain: -30dB to 70dB range • Automatic gain control (AGC) • Gate control • Threshold adjustment • 64 User defined setups • Multiple language display • Multiple calibration and material selection options • Multiple calibration and material selection options
	<ul style="list-style-type: none"> • Differential and minimal thickness alarm modes • Data storage capability: 16,000 readings and waveforms or B-Scans • ElcoMaster® data management software

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23	Hardness Tester - Qualitest - QualiUniversal Fully Auto Load Cell Universal Hardness Tester – QualiUniversal Rockwell (Including full regular Rockwell & Superficial Rockwell), Brinell and Vickers Able to test both metal and plastic
24	JarTester - Humanlab - SF-06 Paddle: Dia. 40mm x 6 Blade: 1" x 3", stainless steel RPM: 20 to 300 Drive: Brushless DC motor 60W power supply: 220VAC, 50/60Hz

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
25	<p>Portable Density Meter</p> <p>-DMA 35</p> <p>- Anton Paar</p> <p>Measuring Range :</p> <p>DeTemperature : 0°C to 40°C (32 to 104°F)</p> <p>Viscosity : 0 to 1000 mPa.s</p> <p>Density : 0.001 g/cm³</p> <p>Temp. : 0.1 °C (0.4 °F)</p> <p>Density : 0.0001 g/cm³</p> <p>Temp. : 0.1 °C (0.1 °F)</p> <p>Ambient Temp. : - 10°C to +50°C (14 to 122°F)</p> <p>Supported mesa. Units : Density, Density @ xx °C, Specific Gravity (SG), Alcohol% v/v, Alcohol% w/w, Alcohol US (°Proof)</p>

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
26	<p>Heat Exchanger</p> <p>-WL 110</p> <p>-GUNT</p> <p>Hot water circuit with tank, heater, temperature controller, pump and protection against lack of water</p> <p>cold water circuit from laboratory mains or water chiller WL 110.20 flow adjustable using valves digital displays for 6 temperature and 2 flow rate sensors</p> <p>water connections with quick-release couplings stirring machine connection with speed adjustment (WL 110.04)</p> <p>functions of the GUNT software: educational software and data acquisition</p> <p>GUNT software for data acquisition via USB under Windows 8.1, 10</p>
	<p>thermostat: 0...70°C</p> <p>Hot water tank: approx. 10L</p> <p>WL 110.01 Tubular heat exchanger</p> <p>WL 110.02 Plate heat exchanger</p> <p>WL 110.03 Shell & tube heat exchanger</p> <p>WL 110.04 Stirred tank with double jacket and coil</p>

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
27	<p>Soil Fertility Kit</p> <p>- Hach</p> <p>Number of tests: 100</p> <p>Platform : Color Disc</p> <p>Includes nine reagents, filter paper, measuring spoon, spatula, clippers, beaker, graduated cylinders, bottles, soil sieve, sprinkler cap, droppers, maker, demineralizer bottle, funnel, scoops, pH tester, viewing tubes, color discs, comparator box, dipstick, instructions, and carrying case.</p>
28	<p>Tachometer</p> <p>- 461893</p> <p>- Extech</p> <p>Non-contact rpm measurements to 99,999rpm with integral light beam</p> <p>Range (rpm) 5 to 99,999</p> <p>Accuracy $\pm(0.05\% \text{rdg} + 1d)$</p> <p>Sampling Time 1sec > 60rpm</p> <p>Resolution 0.1rpm (0.5 to 999.9rpm); 1rpm (>1000rpm)</p> <p>Dimensions 6.7 x 2.8 x 1.5" (170 x 27 x 37mm)</p> <p>Weight 8.8oz (250g)</p>

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
29	<p><u>Portable Multi Parameter Meter</u></p> <p>Model: HI9829 +HI7609829-2+ HI7609829-1 + HI7609829-4 + HI7040L+ HI7698293+HI7698296 + HI7004L + HI7031L + HI9828-25 + HI769829-17 + HI7021L + HI7007L+HI7010L,</p> <p>Brand: Hanna, COO: USA,</p> <p>Multiparameter:</p> <p>pH/ORP/EC/TDS/Salinity/ResistivityDO/Turbidity/ Pressure/Temperature Waterproof Meter with GPS pH Range 0.00 to 14.00 pH, ORP Range ± 2000 mV, mV Range ± 600.0 mV, TDS Range 0 to 400000 ppm (mg/L), EC Range 0 to 200 mS/cm (absolute EC up to 400 mS/cm), Salinity (PSU) Range 0.00 to 70.00 PSU,</p>

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	<p>location tracking of measurements, Oxygen, Dissolved Range 0.0 to 500.0%; 0.00 to 50.00 ppm (mg/L), Atmospheric Pressure Range 450 to 850 mm Hg, Turbidity Range 0.0 to 99.9 FNU; 100 to 1000 FNU, Temperature Range -5.00 to 55.00 °C, Backlit Dot Matrix LCD Display, GPS: Yes, Logging Memory 45,000 records, IP Protection IP67, USB Software, 4m, 10m and 20m cable length can negotiate, Battery Type/Life 1.2V (4) NiMH, rechargeable batteries, Accessories: pH4, pH7 & pH10 Std Solution(500ml), ORP Std Solution(500ml), EC Std Solution(500ml), DO Zero Oxygen Std Solution(500ml), Quick Calibration Std Solution(500ml),</p>

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30	<p><u>Micro Digital Balances</u></p> <p>Model: CY 224C, Brand: Aczet,</p> <p>Capacity: 220g, Pan size mm : 90Ø, 4 digits</p> <p>Readability: 0.0001g, Response Time: 3 sec, Linearity: 0.2mg,</p> <p>Measure Unit: gm, mg, ct, GN, mo, oz, dwt</p> <p>Calibration: Motorised Internal</p> <p>Display: Alpha Numerical LCD Backlite Display with A.E.P</p> <p>Operating Temperature: 10°C to 40°C,</p> <p>Tare Range: Full</p> <p>Dimension (WXDXH) mm: 342.5x212x341</p> <p>Power Supply: AC Adapter 100V- 240V +/- 20% 50-60Hz</p> <p>Net weight with Packing: 8 kgs,</p>

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1	2
31	<p>Moisture Analyzer</p> <p>Model: MB 200, Brand: Aczet</p> <p>Max. Sample weight: 200 g, Minimum Weight: 0.2g,</p> <p>Temperature range: 30°C to 175°C, Technology: Infra-Red Halogen, Readability: 0.001%, Repeatability (sd): 0.1%, Units of Measurement: %M, %D, %R (ratio), Gm/Lt, %M Atro, %D Atro, Display: Graphical Display with LED backlight, Data Storage: Last 1000 Moisture Determination results, Method Memory: 40, Batch Memory: 100, Method Designation: Alpha Numeric, Heating Profile: Standard, Gentle, Rapid, Steps, High Temperature,</p>

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32	<p>Compact High Speed refrigerated Centrifuge Max.</p> <p>Speed 15000rpm(200–15000rpm), Max. RCF 21380×g, Temperature Range: -20°C to 40°C, Certification CE cTÜVus FCC MCA,</p> <p>Rotor Capacity : 5mL×18, 1.5mL/ 2.0mL×24, 0.5mL×36, PCR8×4 Run Time: 30sec–99mins/continuous, Driving Motor Brushless DC motor Safety Devices Door interlock, Over–speed detection, Over–temperature detection, Automatic internal diagnosis</p> <p>Power: Single–phase, AC220V–240V, 50Hz/60Hz, 10A, Dimension[WxDxH]: 338×580×324mm, Weight: 30kg, Accessories: Rotor capacity: 2mL/1.5mL×24/0.2mL×24/0.5mL×24</p> <p>Rotor material: Aluminum alloy , 0.5mL rotor adapter , Model: SCI–24R +AS24–2+ A05P2, Brand: Scilogex</p>

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1	2
33	<p>Handheld Particle Counter</p> <p>Model: VPC300, Brand: Extech, COO: USA,</p> <p>Particle Size Channels 0.3, 0.5, 1.0, 2.5, 5.0, 10μm</p> <p>Flow Rate 0.1ft³ (2.83L/min) controlled by internal pump</p> <p>Count Modes Cumulative, Differential, Concentration</p> <p>Counting Efficiency 50% @ 0.3μm; 100% for particles > 0.45</p> <p>Coincidence Loss 5% @ 2,000,000 particles per ft³</p> <p>Air Temperature -14 to 140$^{\circ}$F (-25 to 60$^{\circ}$C);</p> <p>Accuracy: $\pm 2^{\circ}$F / 1°C</p> <p>Relative Humidity 0 to 100%RH; Accuracy: $\pm 3\%$RH (40% to 60%RH)</p> <p>Dew Point/ Wet Bulb 32 to 122$^{\circ}$F (0 to 50$^{\circ}$C)</p> <p>Dimensions/Weight 9.4 x 3 x 2.2" (240 x 75 x</p>
	<p>Simultaneously measure and display 6 channels of particle sizes (down to 0.3μm), Air Temperature, Humidity, Dew Point and Wet Bulb</p> <p>2.8" TFT Color LCD display</p> <p>Built-in 320x240-pixel camera takes videos (3GP) and photo images (JPEG) and records them in internal 74MB memory</p> <p>Store 5000 records</p>

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34	<p><u>Handheld Digital Brix/RI</u></p> <p>Model: HI96801, Brand: Hanna</p> <p>Range: 0 to 85% Brix, Resolution 0.1 % Brix, Accuracy: $\pm 0.2\%$ Brix,</p> <p>Temperature Range 0.0 to 80.0°C (32.0 to 176.0°F)</p> <p>Automatic Shut-Off after three minutes of non-use</p> <p>Battery Type / Life 9V / approximately 5000 readings</p> <p>Enclosure Rating IP65</p> <p>Dimensions 192 x 102 x 67 mm, Weight 420 g (14.8 oz.)</p> <p>Refractometer Light Source yellow LED</p> <p>Refractometer Temperature Compensation automatic between 10 and 40°C (50 to 104°F)</p> <p>Minimum Sample Volume 100 μL (to cover prism totally)</p> <p>Sample Cell stainless steel ring and flint glass prism</p>

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35	<p>Heratherm™ General Protocol Microbiological Incubator Model: LI-IS060, Brand: LK Lab, COO: Korea, Capacity: 60 L, Temperature Range Ambient +5 ~ 70°C, Control: PID control, Auto-tuning, Display: GLCD (Graphic LCD), Timer: Run start / Wait start (99 hr 59 min), Wire shelf: 1ea, Fan Speed: 1 ~ 5 Step, Size (mm): Internal: w420×d350×h450 mm , Size External: w580×d560×h780 mm, Material Internal: Stainless Steel 304, Material External: Powder Coated Steel, Electric Supply Power: 1 Phase, 220 Vac, 50/60 Hz, 400 W (1.9 A), Safety: Over Temp. & Current Protection, Automatic Fault Sensing System,</p>

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1	2
36	<p>Jar Tester</p> <p>Model : ET 750 (2419160) Brand : Lovibond</p> <p>For Laboratory Use</p> <p>The in-line design makes it easy for users to visually compare multiple samples. The structure is epoxy painted and tested to give to an excellent resistance to the attack of chemical agents and corrosion. The non-skid base keeps the beakers stable during operation.</p> <p>Stirring Speed Control</p> <p>From the front panel it's possible to select the same stirring speed from 10 to 300 rpm for each position, the real speed is shown on the relative display. In addition, the stirring rods can be adjustable in height without the use of tools.</p> <p>Timer Function</p>

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37	<p><u>High Speed Centrifuge</u></p> <p>Model: SCI24, Brand: Scilogex</p> <p>Max. Speed 15000rpm(200–15000rpm), increment:10rpm</p> <p>Max. RCF 21380×g, increment:10×g</p> <p>Speed accuracy ±20rpm</p> <p>Rotor Capacity 5mL×18, 1.5mL/ 2.0mL×24, 0.5mL×36, PCR8×4 Run Time 30sec–99mins/continuous</p> <p>Driving Motor Brushless DC motor</p> <p>Display LCD Safety Devices Door interlock, Over–speed detection, Over–temperature detection, Automatic internal diagnosis</p> <p>Power Single–phase, AC220V–240V, 50Hz/60Hz, 5A, AC110V–120V, 50Hz/60Hz, 8A 200W</p> <p>Acceleration/Braking time 25s↑ 25s↓</p>

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38	<p>Digital Mass Flow Controllers with Indicator"Sensor type Thermal sensor</p> <p>Valve type Normally closed proportional solenoid valve</p> <p>Applicable gases*1 N₂, Air, H₂, He, Ar, O₂, CO₂, etc. (Gases not specifically mentioned here are subject to calibration for N₂ equivalent.)</p> <p>Flow range*2 10 SCCM to 10 SLM 20 to 50 SLM (20 to 30 SLM for CO₂)</p> <p>Control range 2 to 100% (F.S.)</p> <p>Response*3 Total flow rate control range ≤ 1 sec (within ±2% F.S.)</p> <p>Accuracy*4 ±1.0% F.S.</p> <p>Repeatability ±0.25% F.S.</p> <p>Operating differential pressure*5 50 to 300 kPa (100 to</p>

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	<p>Proof pressure 980kPa (G)</p> <p>External leak rate $\leq 1.0 \times 10^{-8}$ Pa·m³/sec (He)</p> <p>Temperature Working temp. 5 to 50°C</p> <p>Accuracy guaranteed temp. 15 to 35°C</p> <p>Allowable storage temp. -10 to 60°C</p> <p>Allowable operating humidity 10 to 90% RH (without dew condensation)</p> <p>Materials of gas contact part SUS316, SUS316L, magnetic stainless steel, Ni, PTFE, PCTFE, and FKM</p> <p>Electrical connection D-sub 15-pin male, high density, HR-10A (two)</p> <p>Flow rate setting signal 0 to 5 V DC (input impedance: approx. 1 MΩ), or 4 to 20 mA (input impedance: approx. 250 Ω)</p> <p>Flow rate output signal 0 to 5 V DC (load resistance 10 kΩ), or 4 to 20 mA (load resistance</p>

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	<p>Digital communication Address setting with RS485 rotary switch or indicator: up to 99 devices (9600 bps)</p> <p>Event input Three contact inputs (non-insulated)</p> <p>Event output Three NPN open collectors (non-insulated, max. rating 35 V, 50 mA)</p> <p>Required power supply (DC)+24 V DC ($\pm 10\%$), 300 mA max. (DC jack, D-sub)</p> <p>Joint*6 1/4 F900 (standard), 1/4 UJR, Rc 1/4</p> <p>Mounting posture Horizontal installation recommended.</p> <p>*1 The gases must be dry and clean, free of corrosive components and foreign matter such as dust and mist.</p> <p>*2 The flow rate calibration units SCCM and SLM indicate a mass flow rate converted to a volume flow rate in cc/min and L/min at 0°C and 1 atm.</p>

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39	<p>Dip Coater:</p> <p>Minimum Withdrawal Rate: 0.01 mm.s⁻¹</p> <p>Maximum Withdrawal Rate: 50 mm s⁻¹</p> <p>Rate Reproducibility: ±0.01% @ 1mm.s⁻¹ ; ± 0.1% @ 10mm.s⁻¹ ; ± 0.3% @ 50mm.s⁻¹</p> <p>Maximum Travel Distance: 100 mm</p> <p>Dip Coater: Maximum Number of Cycles: 1000 cycles</p> <p>Maximum Timer Duration: 99:59:59 (HH:MM:SS)</p> <p>In-built Software Features: Variable: withdrawal speed Repeat cycles Crash detection</p> <p>Programmes: 20 Power Supply: DC 24V</p> <p>Overall Product Dimensions: Width: 200 mm Height: 350 mm (450mm fully extended) Depth: 300 mm</p>
40	<p>Spin Coater & Syringe Pump Bundle.</p> <p>Model No. VTC-100A , Brand: MTI</p> <p>Country: USA</p> <p>500 – 800 rpm, 4" wafer Max With 3 sets of Vacuum chucks & complete Accessories with Vacuum</p> <p>Compat Spin Coater (500–8000) rpm 4" wafer max with 3 sets of vacuum chucks & complete accessories-</p> <p>VTC- 100A</p>

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41	<p>Hollow Fiber Membrane Spinneret :</p> <p>Product Name: high precision Hollow filter blow head</p> <p>Material: stainless steel</p>
42	<p>Gas Sampler</p> <p>P/N 221-425 71</p> <p>An oven with temperature up to 150 C, 6 port manual type valve,</p>
43	<p>Furnace</p> <p>Model: LF-MS230, Brand: LK Lab, COO: Korea, Capacity: 3 L, Temperature Range Max. 1100°C (Continuous Temperature 1000 °C), Control: PID control, Auto-tuning, Display: GLCD (Graphic LCD), Timer: Run start / Wait start (99 hr 59 min), Size (mm): Internal: w130×d250×h90, External: w380×d470×h575, Material Internal: Ceramic Fiber Board, Material External: Powder Coated Steel, Electric Supply Power: 1 Phase, 220 Vac, 50/60 Hz, 1.8 kW (8.1 A), Safety: Over Temp. & Current Protection, Automatical</p>

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1	2
44	<p>Heat Exchanger Train in System(Base Service Unit)</p> <ul style="list-style-type: none">- WL 110-GUNT <p>Supply unit for heat exchangers</p> <p>Hot water circuit with tank, heater, temperature controller, pump and Cold water circuit from laboratory mains or water chiller WL 110.20</p> <p>Temperature controller controls the temperature of hot water Flow adjustable using valves</p> <p>Digital displays for 6 temperature and 2 flow rate sensors Water connections with quick-release couplings Stirring machine connection with speed adjustment (WL 110.04) Pump power consumption: 120W max. flow rate: 600L/h max. head: 30m Heater power output: 3kW thermostat: 0...70°C Hot water</p>

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1	2
45	<p>Plate Heat Exchanger</p> <p>Model : WL 110.02</p> <p>Brand : GUNT</p> <p>Country of Origin : Germany</p> <p>Plate heat exchanger for connection to WL 110</p> <p>Hot and cold water supply from WL 110</p> <p>Parallel flow and counterflow operation possible</p> <p>Six soldered plates</p> <p>Recording of temperature using WL 110</p> <p>Technical data</p> <p>6 plates, stainless steel</p> <p>Heat transfer surface: 480cm²</p>

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SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
46	<p>Shell & Tube Heat Exchanger</p> <p>- WL 110.03</p> <p>-GUNT</p> <p>Shell and tube heat exchanger (cross-flow) for connection to WL 110</p> <p>Hot and cold water supply from WL 110</p> <p>Cross parallel flow and cross counterflow operation possible</p> <p>Transparent shell, visible tube bundle</p> <p>Tube bundle consisting of 7 tubes and 4 baffle plates</p> <p>Recording of temperature using WL 110</p> <p>Heat transfer surface: 200cm²</p> <p>Tube bundle, stainless steel</p> <p>outer diameter: 6mm</p> <p>wall thickness: 1mm</p> <p>tubes, 7</p> <p>Shell, transparent (PMMA)</p> <p>outer diameter: 50 mm</p>
47	<p>Digital Refractometer</p> <p>Model : PAL -Alpha(3840)</p> <p>Brand : Atago/ CoO : Japan</p> <p>Range: Brix: (0~85.0%)</p> <p>Resolution: Brix: 0.1%, 0.1°C</p> <p>Measurement Temperature :10~75 °C</p> <p>Measurement accuracy: Brix: ± 0.2%</p> <p>Weight: 100 g</p>

8. Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
48	<p>BOD Measurement System (BD600)(#2444460) - Lovibond</p> <p>Direct sample selection and direct display of BOD values.</p> <p>User selectable measuring period from 1 to 28 days and auto start function after temperature equalisation.</p> <p>Ranges:0-40/0-80/0-200/0-400/0-800/0-2000/0-4000 mg/l</p> <p>Accuracy :0.5% full scale at 20°C</p> <p>Application :BOD5,BOD7,OECD 301 F</p> <p>Display :4 digit 7-segment LED</p> <p>Parameter :BOD range ,volume ,duration ,time of measurement</p> <p>Auto result storages :Up to 28 results</p>

8. Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
	<p>Thermostatically Controlled Incubator (#2438210) Designed in CFC Free, backlit display, 2°C to 40°C adjustable. Fully insulated cabinet with universal temperature control. Specification Door : Glass door in an aluminum frame Control range: 2°C to 40° C Climates Class: +10°C to +32°C Fan : Radial, output 320m³/h Cooling and heating: Integrated powerful cooling and heating Capacity : 140L</p>
49	<p>Water Distiller -WS 4000 - Boeco Flow rate: approx 4l/h Cond. of distilled water 20°C: Approx 1.5µS/cm Heater: 3KW Cooling water: approx 60 l/h Outer part: stainless steel Dimension: 435x370x220mm (HxWxD) Switch: Main power with pilot lamp Sealing: silicon gasket</p>

8. Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
50	<p>Rotary Evaporator with Vacuum Pump (RV-10 Digital V)(10004799) -IKA</p> <p>Motor type: brushless DC motor, Motor rating input :50 W, Speed range 20 to 280 rpm, Speed display: digital , Clockwise and counter clockwise : Yes</p> <p>Soft Start : Yes , Head angle adjustable : 0 to 40° Stroke displacement 140mm,motorized , Setting of lower end stop: 60mm,contact free Dimension :530Wx410Dx430H mm Permissible ambient temperature : 0-45°C Oil Free Vacuum Pump Model: R-300 (BOE 8830000) Vacuum : 650 mmHg;</p>

8. Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
51	<p>Over Head Stirrer</p> <ul style="list-style-type: none">- Euro-Star 20 Digital(4442000)-IKA <p>Stirring Qty (H₂O): 15L</p> <p>Max Viscosity: 10,000 mPas</p> <p>Motor Rating input: 56 W</p> <p>Motor Rating output: 44 W</p> <p>Output at stirring shaft: 126 W</p> <p>Max. on Time: 100%</p> <p>Max torque at chuck: 60 Ncm</p> <p>Speed Range: 0/30-2000 rpm</p> <p>Speed Display: digital</p> <p>Dimension: 86 x 208 x 248 mm</p> <p>Permissible Ambient Temp: 5-40°C</p>

8. Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
52	<p>Shaking Water Bath</p> <p>-LSB-030S</p> <p>-LabTech</p> <p>Precision Digital PID Controller</p> <p>Capacity : 30 Liters</p> <p>Heater:2.1 kW</p> <p>Shaking speed : 20 to 250 Stroke /min</p> <p>Shaking stroke : Adjustable 15 to 30 min</p> <p>Temperature range : Ambient + 5°C ~99°C</p> <p>Temperature (Set accuracy) : ± 0.1 °C</p> <p>Temperature (Uniformity) : ± 0.5 °C</p> <p>Material :Stainless Steel</p> <p>Bath Dimensions : 500 x 300 x 240 mm(WxDxH)</p> <p>Dimension (Outer) : 734 x 344 x 300 mm (WxDxH)</p> <p>Controller : Digital PID Controller</p>
	<p>Material (interior) : Seamless stainless Steel (SUS304)</p> <p>Material (Exterior) : Powder coated steel</p> <p>material (Rack) : Stainless steel Spring Rack</p> <p>Safety : Over Temp. Cut-off</p> <p>Electric Supply : 110V 60Hz or 220V 50V 60Hz</p>

8. Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
53	<p>pH/Con/TDS/Oxi Meter Model: SensoDirect 150 Set (724200) Brand : Lovibond Country of origin : Germany Parameter : pH, Conductivity, TDS , Oxi</p> <p>pH range : 0–14.00 pH, TDS range : 0–132 ppm/0.1 ppm Con range : 0–200 µS/ 0.2–2 mS /2–20 mS/ 20–200 mS Dissolved Oxygen: 0 to 20.0mg/l Data logger : Real time data logger pH calibration : 3 points calibration Display : Large LCD display Power supply : 4x 1.5 V (UM3 AA) Main unit, batteries, pH electrode, temperature probe, conductivity probe, Oxygen Sensor, pH buffer set(4/7)</p>
54	<p>Dessicator Model :41161025, 41175025 Brand : Assistant Country of Origin : Germany Desiccators "Novus" with stopcockin cover, 25 cm Desiccator porcelain plates for: 25 cm</p>

8.Chemical Engineering Lab Equipment

SR No	DESCRIPTION OF EQUIPMENT (TECHNICAL DETAILS)
1	2
55	Hot air oven - LDO 060E -Labtech LED 4 digits Display Capacity Liter : 56 Liter Temperature Range : Ambient +5°C to 250°C Temperature Set Accuracy : +0.1°C Temperature Uniformity : +3.0°C at 120°C Rapid heat up 25 min up to 250°C
56	COD Reagents for COD Reactor(16 tubes) Measure range : 10 - 150 mg/l , 100 - 1500 mg/l , 1000 - 15000 mg/l, Brand: MRC,