

S.N.	Instruments	Specifications
1	Flow Cytometer	A24864 ✓ Attune™ NxT Flow Cytometer, blue laser (488 nm) , 6 Detection Channels, diode power (100 mW), Flow Cell: Quartz cuvette gel coupled to 1.2 numerical aperture (NA) collection lens, 200 x 200 µm. ✓ Fluorescence Sensitivity: ≤80 molecules of equivalent soluble fluorochrome (MESF) for FITC, ≤30 MESF for PE, ≤70 MESF for APC ✓ Sample volume: 20 µL to 4 mL ✓ Sample tubes: Accommodates 17 x 80 mm to 8.5 x 45 mm tubes ✓ Fluid reservoirs: 1.8 L focusing fluid tank, 1.8 L waste tank, 175 mL shutdown solution tank, and 175 mL wash solution tank\ ✓ Standard reservoirs “ 1.8 L focusing fluid tank, 1.8 L waste tank, 175 mL shutdown solution tank, and 175 mL wash solution tank ✓ Consumption: 1.8 L/day ✓ Fluorescence resolution: ✓ Minimum particle size: 0.2 µm
2	Automatic microtome	✓ Section thickness range should be between 0.25 to 100µm with increments in the range of 0.5µm, 1µm, 5µm with LED display. ✓ Trim thickness range should be 1-600µm with 1µm, 2µm, 5µm and 10µm increments, respectively with LED display. ✓ Vertical stroke 70-80mm. Specimen advance 30-35mm. ✓ High profile disposable blades pack as well as low profile disposable blade pack, each. ✓ Five years of warranty and validation of instrument should be done every six months. ✓ One branded vacuum pump; Gast Vacuum/pressure diaphragm pump with gauges, regulators, and relief valve, single head, 1.0 cfm, 220/240 VAC. ✓ Desiccator SCHOTT DURAN DN300, Outlet in Lid with Stopcock, flat flanges, NOVUS junction and porcelain plate should be quoted with the system. ✓ One UVP make hybridization oven HB-1000 with orbital tray and rocker tray with stacking kit for UVP HB-2000. ✓ Standard flat embedding mold made up of silicone at least twenty, with 21 numbered cavities measures: 14mm(L) x 5mm(W) x3mm (D). Should be reusable and must withstand 65°C temperature. ✓ Slide warmer hot plate with digital temperature display and control. ✓ A vibration free table to accommodate the instrument. ✓ Dumont precision tweezers made of titanium, Type 5, six in numbers, (thickness of tip 0.01mm, width of tip 0.05mm and length 110mm), Type 3, six in numbers, (thickness of tip 0.1mm, width of tip 0.17mm and length 120mm). ✓ Price of individual components should clearly be specified in the stand
3	Nanodrop, spectrophotometer	✓ Sample Volume – 0.5µl to 2 µl . Sample Number - 1 Path Length: 1mm (auto ranging to 0.05mm). ✓ Light Source: Xenon flash lamp Detector Type - 2048 – element linear , Silicon CCD array Wavelength Range – 190 – 840nm Wavelength Accuracy 1 nm Spectral Resolution < 1.8nm (FWHM at HG 253.7nm) Absorbance Precision: 0.002 (1mm path) Absorbance Accuracy: 2% (at 0.76 absorbance at 257 nm) Absorbance Range : 0.02-300 (10mm equivalent) Detection limit: 2ng/µl (ds DNA) Max. Concentration : 15,000 ng/µl (dsDNA) ✓ Measurement Time: <5 seconds Footprint : 14 x 20cm Sample Pedestal – Material of Construction – 303 stainless steel and quartz fiber Operating Voltage – 12 vdc ✓ Operating Power consumption 12 – 18 W (max 30W) Standby Power Consumption – 5W Software Compatibility – Windows® XP and Vista™ (32 bit). Increased dynamic range for dilute samples (e.g. to 0.4 ng/uL for sDNA) Support for kinetics experiments OD measurements for bacterial cultures Built-in stirring capability Temperature

		control at 20 ⁰ C to 37°C Pre-programmed methods for:
4	Fermenter	Technical Specifications Vessel standard- The vessel should be designed as per ASME standards to comply with the requirements of the pressure vessel and bioprocess. Total Volume-7L Working Volume- 5.25L D/H Ratio-1:2:5 Design pressure: 3.75 kg/cm² at full vacuum: 0 to 150° Design temp. Material of Construction (MOC): all contact parts are SS-316 & non-contact are SS-304 Thickness: Vessel shell: S.S. 316 L ,thickness 3mm Jacket shell : S.S. 304,thickness 3mm Top Plate : S.S 316 L and thickness 20 mm TOP PORT (S.S. 316 L) Fermenter vessel will consists of SS316L Ports: inlet port, air inlet and outlet/ Vent port, pressure gauge port, inoculums port, one additional port, Light glass, for dosing acid, base, antifoam etc. SIDE Ports (S.S. 316L) Fermenter vessel having sparger port, Temperature sensor, pH sensor & sampling Valve. Harvesting port in the bottom of the vessel. MOC: S.S. 316L, Size : 25mm Inner Surface: 240 grit finished & mirror polished. M.O.C.: All contact parts are SS-316 & Non-contact are SS-304 Gaskets and O' rings: Silicon/EPDM material. Sight Glass Assembly : Fermenter vessel having sight/view glass assembly of size: 30 x 150 mm, MOC-S.S. 316 L. glass thickness: 15 mm. Provision of Ports- Provided on the top plate for safety valve, Agitator assembly, light glass, pressure gauge. TFF Cartridge, Anti foam pump+ Probe & drier (Lyophilizer) An additional two nos. of ports have provided. Air sparger, 3 nos. of Standard ports for acid, Alkali and feed. At 1/3 height from bottom- 25 mm standard ports for pH ,temperature probes and a sampling valve, In the bottom dish- Drain valve, in jacket Steam/water entry- standard ports- 2nos, Jacket drain- standard – I no. Mixing System/Agitator Assembly: SS316 L Stirrer Assembly with shaft, 2 smooth bearings, Height Adjustable Rushton turbine Impeller 3 no having 6 blades, single mechanical seal with THP Servo motor with Drive, RPM :0-1500. Impellers:- Rushton turbine type standard impellers, 6 blades three impellers, removable type and made of SS316, Motor: 0.4kw/0.75kw, RPM :0-1500 with Servo motor & drive, Servo motor with single mechanical seal. Baffles:- SS316L 4 Nos. Baffles of width 1/10 of ID covering bottom to working volume for breaking the vortex for proper mixing. Baffles are removable Type. Drain valve: 1/4" Diaphragm valve Lantern & Bearing housing assembly: Housing with two bearings No. of legs: 3, SS304. Air Filter: Aeration from compressor, air pressure controlled with Glass Metered Needle Valve Rota meter 0 to 20 LPM and fitted with 0.2µ Inlet filter air filter .The filter is PTFE, Hydrophobic and Autoclavable Type. Consists of Inlet and outlet filter : 0.2 Micron PTFE, cartridge, 2.5 inch.; In- situ sterilizable Sterilization: Control valves to control sterilization of fermenter with steam i.e. sterilizable in place(SIP) as per ASME standards, Fermenter vessel with contact parts SS316L and non-contact parts SS304. Automatic Temperature Controller: Automatic, RTD temp. sensor (Pt.-100),19mm with SS pocket and port, Digital Temperature Indicator cum controller. Heating Assembly: SS-304 Heat Exchanger with Steam Coil/heater. Automatic RPM Controller: Variable RPM control within 0 to 1000RPM with Servo motor and VFD.Auto control of temperature and variable RPM of agitator by providing four solenoid valve with variable frequency drive with control panel. Foam/ Level Controller:SS316L Conduction probes for automatic Level Foam control. Time Proportionate Control. Provided with one number peristaltic pump with antifoam sensor and cable. pH Measurement & Control: Supplied with a Gel filled type pH Sensor/Probe with cable, Measuring Range: 0 to14,Control Accuracy: ±0.1pH. (Make: Broadly james).Provided with 2 Nos. of Peristaltic pumps (fixed speed) for addition of Acid/ Base with suitable silicon tubing for acid/alkali Addition into the vessel. The system having Auto pH Calibration with 2 point or 3 points calibration i.e. either using 2 Buffers or 3 buffer.
5	Gel Documentation	✓ The system should be capable of supporting fluorescence and colorimetric detection methods. ✓ Maximum sample size 28x36cm; image area 25x21cm; with 3 modes of illumination control (trans-UV, trans white and epi-white)

		✓ Camera resolution should be 3-4 mega pixels; Effective resolution between 12 – 15 megapixels Upgradable to chemiluminescence. ✓ Desktop computer and software for image analysis and storage. Software with analytical features. UPS 2KV - online
6	SDS PAGE UNIT	✓ MINI dual Vertical Electrophoresis Unit, with 10 cm x 8 cm plates (L x W) ✓ Buffer Volume: Approximately 250ml ✓ Two gels to be run simultaneously ✓ Provided with Platinum electrodes (98% proof) having thickness of at least 0.6 mm or more ✓ Assembly with gel sandwiches and electrophoresis units should be leakproof, quick and easy to assemble. ✓ Provided with safety lid. ✓ Provided with alumina back plate and glass notch plates. ✓ Well Teflon comb 1.0 mm (4 nos.) and 1.5 mm (6 nos.) ✓ Teflon Spacers 1.0 mm (4 nos.) and 1.5 mm (6 nos.) ✓ Silica/Glass plates notched and rectangular (15 nos. each) ✓ Gel caster for Two Gels. ✓ Power cord (1 no.). ✓ 2 years comprehensive warranty of electrophoresis unit including electrodes and leak-proof
7	Refrigerated Centrifuge	✓ The System should be tabletop with user friendly LCD back light interface with capacity of 3-4L volume centrifugation. ✓ The system should be provided Swing/Fixed angle rotor (Autoclavable) capacity with max of 14000 RPM, 22000xg and all adapters ✓ Should have certified click Seal or Quick Lock bio containment/autoclavable lids with easy access of one handed operation. ✓ The operating temperature should be of the range of -10° C to room temperature, maximum timer range of 30 s to 99h continuously with 99 programs or better. ✓ Should have compact foot print and low noise ✓ The refrigeration in the centrifuge should be CFC free ✓ Sound level should be in the range below 55 for all the rotors. ✓ Anti-Vibration table ✓ The system should have an imbalance detection system to avoid damage to the centrifuge with continuous vibration measurement.
8	RT-PCR	✓ Real Time PCR System for measuring Real-time amplification of DNA/RNA from purified samples, application include Quantification assays, Qualitative assays, SNP, HRM, Gene Expression, any published protocol or chemistry should be reproduced. ✓ Instrument should be with stand-alone operation independent of Computer work station. ✓ System should have a port for USB Drive for uploading and downloading data and programs. ✓ Dedicated Peltier-based Real time Thermal cycling system, Electro formed silver mount 96-well block can accommodate both 96 well PCR plates as well as 8-Tube Strips with clear caps. ✓ System should have a temperature accuracy of ± 0.2 °C and well to well Temperature Uniformity of ± 0.1 °C ✓ System should have Gradient function for the temperature programmable of 20 °C gradient range. ✓ System should allow Optimum reaction volumes of 0.2 (10µl to 100µl) or more ✓ System should have sample ramp rate more than 4°C while heating and less than 2°C while cooling. ✓ System to provide on line Cycle by Cycle monitoring with continuous display of readings for Fluorescence, Temperature changes and progression of amplification and detection simultaneously on all 96 wells on the plate without any moving parts. ✓ RT-PCR system should have fiber optics for high accuracy and easy multiplexing on probed assays.

		✓ PCR Plates & micro centrifuge tubes, Pippets (0.5 to 10 micro L, 20-200, 100 to 1000micro litre) ✓ PCR Kits ✓ System should have individual well to well excitation and emission for better sensitivity for capturing the signals without any edge effects. 12. System should have broad range high-intensity white LED as an excitation source. ✓ Working Programmable range 37 to 99 °C, Sensitivity from 1 copy detection and dynamic range of 10 orders of magnitude. ✓ System should be compatible with all kind of chemistry Syber green and Hydrolysis probe and compatible with all kind of kits in market. Should be open system for both reagents & disposable plastic consumables. ✓ System should use cooled CCD camera for detection without any moving detectors or scanning detectors ✓ Instrument filters should be divided based on the wavelength starting from 400 to 700 nm ✓ System should have a minimum of Eight filters, Four Excitation filters (470/533/577 and 645 nm) and Four Emission filters (514/572/620 and 697 nm) to cover majority of the commercially available dyes ✓ Multiplexing capacity: true 4 color multiplex analysis without any passive reference dye. ✓ System should be Calibrated for Detection Dyes: SYBR, FAM, ResoLight dye, VIC, Hex, Yellow555, Red610, Texas Red, and Cy5. Any new dyes should be used with in the filter settings. ✓ System should be free of passive reference dye. ✓ System should be capable of Simultaneous data acquisition for all positions in 10-1000 ms (dynamic mode) ✓ Fast run time, Runtime < 30 min for 3-step 40 cycles PCR ✓ should have preferably 10-inch colored LCD touch Screen display for smooth operation while standalone usage and online fluorescence display ✓ The real time PCR software should allow the user to do the analysis of all type of application like., a. Absolute quantitation b. Advanced Relative quantitation c. Multiplex-PCR allelic discrimination (SNP) d. Tm Calling (Meltcurve Anlysis-Sybr) e. Endpoint Genotyping f. Qualitative Gene detection g. High Resolution Melting curve analysis (HRM) for mutation studies h. Pathogen detection and plus/minus assay. 25. Necessary control/QC kits for installation should be supplied along with instruments. Accessory: ✓ Refrigerated Micro centrifuge (01) ✓ To Centrifuge different kinds of biosamples (suitable for microvolume protocols such as DNA, RNA purification, PCR setup) in research Labs at room Temperature and cold (4°C) ✓ Type of Motor: Brushless (without carbons). ✓ Display Type: LCD ✓ Parameters to be displayed by the digital display: RPM, RCF, set time, Run time, Rotor running indication, misbalancing if any. ✓ Type: Benchtop Centrifuge ✓ Rotor with bio containment lid should be included with the microcentrifuge ✓ Outstanding corrosion resistance with lightweight rotor, easy to clean and maintain and autoclavable ✓ Rotor capacity: 24 x 1.5/2 mL ✓ Rotor Type: Fixed angle standard rotor should be able to accommodate 24 microcentrifuge tubes in a single row, from 1.5 to 2.0 mL tubes to mini-preps and spin columns. ✓ Rotor imbalance diagnostics and automatic stop if required: Yes ✓ Max. Speed: 13,000 -14,000 rpm 12. RPM setting accuracy: ± 5%
9	Deep Freezer (-80 ⁰ c)	✓ Upright Vertical Deep Freezer

		✓ Temperature range -10°C to -40°C ✓ Direct Cooling Type ✓ Microprocessor controlled system. ✓ Capacity 260 – 265 Lit ✓ LED Display ✓ Minimum 7 drawers required ✓ CFC- free refrigerant. ✓ Noise level less than 45 dB. ✓ Alarms for systems malfunction over and under temperature & sensor error ✓ Equipment should CE Certified. ✓ Warranty period to be mentioned ✓ AMC charges to be indicated
10	HPLC(High performance liquid chromatography)	A complete Modular HPLC System with individual module wise Pump, Auto Sampler, Detector, Column Oven, Column along with 21 CFR Part II compliance Software, must be from a single manufacturer with 3 years warranty and necessary PC-Printer. Pumps: Pump should provide error-free programming of pump parameters including flow rates, operating pressure limits, compressibility compensation, calibration and diagnostics. ✓ The Solvent Delivery Unit (Pump) should be capable of operating with 2 or more Solvents at a time during gradient operation limits, compressibility compensation, calibration and diagnostics. ✓ Number of solvent channels should be Four. ✓ Settable flow range should be from 0.001 – 5.0 mL/min or better, in 0.001 mL/min increments. ✓ Flow precision value should be ≤ 0.07 % RSD or better ✓ Flow accuracy should be ± 1 % or better ✓ Must deliver a flow rate of up to 5.0 mL/min or better ✓ Must have an operation pressure range of 0 – 800 bar (11600 Psi) up to 5 mL/min or better ✓ Pressure pulsation < 1 % amplitude or better ✓ Should have a pH range 1.0 — 12.5 or better ✓ Integrated online degassing unit for minimum 4 channels. ✓ Composition precision should be < 0.15 % RSD. ✓ Delay volume ≤ 350 μL or better ✓ Active seal wash ✓ Compressibility compensation : Automatic ✓ Capable of Convenient , Precise and Accurate Buffer or Additive blending- using the software feature implemented in the pump driver ✓ Enables automatic software-embedded functionalities such as switching the optional mixer in and out or automatic purging ✓ Should have facility to ensures seamless method transfer/ delivering the same chromatographic results of other HPLC or latest UHPLC method ✓ Should have the provision for complete upgradation capability (module wise and system wise) in future. 2 Auto Sampler Auto-sampler ✓ The Auto sampler must have a capacity to hold 100 samples. ✓ Must have an operation pressure range of 0 – 800 bar (11600 Psi) or better ✓ Injection range should be 0.1 to 100 μL. ✓ Sampler should be capable of injection volume range upto 1800uL or higher with additional loop and hardware modification as and when required. ✓ Precision should be PDA detector ✓ Wave length range: 190-800nm • ✓ Detection type : Double beam photometer

		✓ Light source : Deuterium lamp ✓ Wave length accuracy : + 1nm ✓ Wavelength Precision: ✓ Number of Signals : Single & Dual Wavelength ✓ Data Rate: For fast programmable single wavelength :up to 120 Hz. ✓ RFID tracking technology for flow cells and UV lamp. ✓ Time Programmable :Wavelength, polarity, Peak width, lamp on/off ✓ Spectral tools: Stop flow wavelength scan ✓ Safety and Maintenance: Extensive diagnostics, error detection and display, leak handling, low voltages in major maintenance areas ✓ GLP Features: ✓ Facility to get feedback for continuous tracking of instrument usage in terms of solvent usage with user settable limits and feedback messages. Analytical columns ✓ Analytical Columns ✓ C18 column (3 mm ID x 150 mm length, particle size 2.7µm) : Qty-1 ✓ C18 column (4.6 mm ID x 250 mm length, particle size 5µm): Qty-1 C8 column (4.6 mm ID x 250 mm length, particle size 5µm) : Qty-1 Silica column ((4.6 mm ID x 250 mm length, particle size 5µm): Qty-1 ✓ Phenyl column ((4.6 mm ID x 250 mm length, particle size 5µm) : Qty-1 ✓ Cyanide column ((4.6 mm ID x 250 mm length, particle size 5µm) : Qty-1 ✓ Guard Cartridge (minimum 4 Nos) for above categories columns } Guard Holder Thermo stated column ✓ Column Oven must be a module: not be an integrated with any other module. ✓ Temperature range: 10 °C below ambient (minimum 4°C) to 85 °C or higher Settable in steps ✓ Temperature stability: ± 0.1 °C ✓ Temperature Accuracy: ± 0.5 °C ✓ Temperature Precision: 0.05 °C ✓ Independent temperature Zone: 2 in a single device ✓ Capacity: Should be able to hold at least 4x 300mm columns. ✓ Should have future upgradable facility with 4 column selector valve to access each column without replumbing ✓ Heat up/cool down : 5 min from ambient to 40 °C 10 min from 40 °C to 20 °C Chromatograph Software ✓ Windows based software for evaluation of data, control and operation of entire system. ✓ System security to be provided by the software and not by the operating system ✓ User accounts, user privileges and audit trails are maintained by the software and not by the operating system ✓ Compliance with cGMP/GLP ,Electronic signature & Electronic Record rules ✓ Software should have its own built in report . Data that has been reviewed and approved may be locked to prevent further manipulations ✓ Software should offer extensive custom calculation capabilities (Concentration, calibration curve, peak soothing, peak subtraction etc.) eliminating the need for external applications to meet the laboratory need. • 21CFR Part II Compliance Consumables: ✓ Screw Cap Vials (1.5-2.0ml) : 500 Nos ✓ Amber Vials (1.5-2.0ml) : 10 Nos ✓ Glass filter, solvent inlet- : 4 Nos ✓ PTFE Glass filter 13mm 0.45 µm : 1000 Nos ✓ 10 mL disposable syringe : 100 Nos ✓ PTFE Frits : 5 Nos ✓ Union Qty-1 No. ✓ Caffeine Std Kit System Warranty
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		3 Years total coverage of HPLC system along with PC-Printer by Warranty Along with power back up 1KVA
11	Elisa Reader	✓ Microprocessor based PC controlled ELISA reader compatible for 96-well plates ✓ Photometer: 8/12 measurement channel and 1 reference channel (Minimum) ✓ Wavelength range: 350-750nm. ✓ Machine must be supplied with at least 4 standard filters (405, 450, 492 & 620 nm filter) ✓ Absorbance range: 0 to ≥ 3.0 OD. ✓ Should have a photometric accuracy of $\pm 2\%$ or better ✓ Light source: LED/Halogen Lamp with lamp save features ✓ Detector: photodiodes ✓ . Measurement speed: Fast measurement, preferably up to 15 seconds at dual wavelength mode ✓ Resolution: 0.001 OD or better ✓ Should have external printer connectivity option ✓ Power Requirement: 220-240V, 50Hz. ✓ Warranty: Minimum of 02 years on spares and service. ✓ Essential spares like fuses (n=2) and lamp (n=1) should be included and quoted with the machine in the price bid. ✓ Software for operation should have lifelong validity and in case of breakdown, company should provide license free of cost. ✓ Technical features described above should exclusively be supported by authentic original illustrated company catalog of the instrument/equipment quoted. Only Compliance sheet without company catalogue will not be accepted. ✓ The bid must be in INR. 18. List of user for last 3 years in India to be provided. ✓ The supplier will be responsible for supply and installation of instrument at various specified locations attached in the annexure within India without any extra cost ✓ 96 Well Plates & 24 Well Plates.\
12	Planetary Ball mill	✓ Table-top compact design with minimum 2 grinding stations or more ✓ Speed should be 30 Hz or more ✓ The instrument has to be usable for both dry and wet grinding ✓ Touch screen controller ✓ Noise Level less than 70 dB ✓ System should be compatible with different feed materials with sample volumes up to 20 g x 2 or more ✓ Grinding stations should accommodate different size jars of 2 mL to 50 mL ✓ System should run with standard single phase AC voltage ✓ Protection code IP30 or better ✓ System should be provided with 50 ml Grinding Jar of Stainless Steel (2 Nos) ✓ b) 35 ml Grinding Jar of PTFE (2 Nos) ✓ c) Assorted Grinding Balls of Stainless Steel (500 gms or more) ✓ d) Assorted Grinding Balls of PTFE (minimum 06 Nos) e) Any fittings, wrench or tool box required to make the equipment fully functional.