

## Specification of scientific equipments to be procure through NIT No.02/10-11

Sr. No.	Name of equipment	Specification	Qty.
1.	Water Analyzer Kit	Should be portable & multiparameter and sturdy with the help of potentiometric, colorimetric/ spectrophotometric techniques for respective parameters, the range with accuracy of pH meter 0-14, 0.01± 1 digit pH, ORP range with accuracy 0-14, 0.01pH, conu±1 conductivity.	1 No.
2.	Water purification system	<p><b>a)</b> The system should have two stage prefiltration system with 1 micron polypropylene filter with noise free DC pump. It should have iron removal filter which can take care of iron content in input water up to 4ppm and can deliver consistently 0.1ppm at output. It should have a three stage purification process primary purification by a prefilter and secondary purification through a high density RO membrane, final step with an electro deionization module. The resistivity cell should be coaxial with a cell constant of 0.01 per cm. system should measure and display compensated and non- compensated temperature accurate ±0.01 degree centigrade.</p> <p><b>Product</b> water quality: Resistivity upto 18 Meg OHM cm, TOC &lt; 5-10 ppb, bacteria &lt;1 cfu/ml, pyrogen &lt; 0.001 EU/ml, flow rate 1-2 litres/hours. An application specific ultra pure cartridge for removal of organic contaminants and an absolute 0.22 micron validated pharmaceutical grade sterilizing PVDF membrane final filter.</p> <p><b>System</b> should have a storage tank of 50 litres capacity with built in sensor for low/high water level. The point of use of gun should allow for volumetric dispensing (0,25-64.5 L with 0.25 L increment) and should discontinue un attended dispense after 30 minutes. The water purification system should have a footprint of &lt; 1 sq mt. The system should have automatic display of alarms, quality parameters and routine maintenance indications. It should have an option of connecting a UF cartridge to obtain rinse and pyrogen free water.</p>	1 No.
		<p><b>b)</b> Produced water should be useable in critical application HPCL mobile phase preparation, sample dilution in GC, HPCL, Atomic Absorption, preparation of buffer and cell culture media, reagent preparation in molecular biology etc.</p>	1 No.
3.	Automatic weather station	Basic weather station 200 (BWS 200) consisting of weatherproof enclosure containing data logger with power supply. Solar panel and different sensors. Data loggers should be high accuracy and fully programmable. Accuracy of measurements ± 0.25%, temperature accuracy ± 0.3 <sup>0</sup> C, relative humidity accuracy ± 2%, wind speed accuracy ± 0.5 m/s, sensitivity of rainfall measurement ± 0.20 mm, Enclosure should be fiber glass having dimension 350 x 250 x 120 mm, solar panel model SOP 5/X rated upto 4.5 w and 260 mA. PC 200 w software attached with the model for automatic data recording.	1 No.

4.	Electrophoresis system	Complete system with Apparatus dimension (W x L x x D: ~ 25 x 45 x 10 cm), gel size ~ 20 x 20 cm, with chamber safety lid, UV transparent gel tray, with gel casting tank, different combs (15 – 40 wells, 1.0, 1.5, 2.0 mm thick), rubber feet for chamber and manual. Cooling base optional. Accessories to include two comb of 28 and 40 wells.	1 No.
5.	Portable Ultra-sonography equipment with all standard access.	Exclusive veterinary version, probes of 5.0/7.5/9.0 MHz 50 mm veterinary rectal probe and 3.0/5.0/7.0 MHz Microconvex probe, 9” B/W monitor, 256 grey scales, 4 - stage dynamic focus transmitter and real - time dynamic focus receiver, display in B, B+B, B+M, M modes and a flash memory of at least 60 images. With optional accessories viz. image printer, image utility software for transfer of JPEG files, trolley, biopsy guide, video output two channels and input one channel.	1 No.
6.	Platform balance (2000 kg)	Pit mounted heavy duty platform balance with the capacity of 2000 Kg and readability of 500 gm for weighing large animals. Corrosion resistant steel loadcells. The platform metal should be slip resistant with the size of 2.5 x 2.5 m and digital indicating system. Minimum height platform with no projections above platform.	1 No.
7.	Platform balance (120 kg)	Electronic light duty platform balance for weighing small animals with the capacity of 120 kg and readability of 20 gm with the SS/MS platform size of 600 x 600 x 220. Internal battery back up of 12 hours.	1 No.
8.	Electronic Field Balance - 5 Kg cap.	5.0 kg Capacity (It will be used for data recording of different crops such as vegetable crop like to made, Potato coater, Cash, Mushroom, ladyfinger, onion, cowpea & Bottle ground etc. under crop desiccator's crop).	1 No.
9.	Electronic Single Pan balance	Weighing range is 1000 gm, Readability – 0.1 g, LCD display.	1 No.
10.	Micro Centrifuge	Microprocessor controlled micro centrifuge with RPM of 13500, RCF of >12000g; capacity of 1.5 or 2.0 ml x 12 tubes; It should have digital feedback control with jog shuttle switch and digital backlit LCD display with timer facility for ~100 minute and continuous mode. It should have air cooling device with brushless DC motor having direct drive system. The acceleration and braking time should be <15 sec (for max speed). The centrifuge should have auto stop facility on door opening with motor error detection. It should have low noise level (<60 dB) and should occupy less bench space. It should operate in power of AC ~230V, 50 Hz with power consumption of <100W.	1 No.
11.	B.O.D. Incubator	a) Capacity – 200 liter, CFC free refrigeration, Temp range – 5 to 60 <sup>0</sup> C, made of stainless steel, Temp control air circulation, equipped with timer facility.	1 No.
		b) Capacity around 200 liter, CFC free refrigeration, Temp range – 5 to 60 <sup>0</sup> C, made of stainless steel, Temp control air circulation.	1 No.
12.	Milking machine	Bucket milking system with two buckets on one vacuum line. Should be able to milk at least 15 animals in one hour. Vacuum pump capacity of minimum 170 l/min with the motor power of 0.75 kW.	1 No.

13.	Hot plate	Standard quality, temperature up to 370 <sup>0</sup> C, automatic temperature regulator.	1 No.
14.	Laboratory centrifuge alongwith standard access. and rotors	Microprocessor controlled operation, brushless induction motor, Programmable centrifugation cycles, automatic imbalances detection. Automatic rooters recognition, bright, easy-to-read digital display, Maximum RCF around 3650 x g with maximum volume of 300 ml for fixed angle rotors. Maximum RCF around 2650 x g with maximum volume of around 240 ml for swing out rotors. Various adapters for different applications. Speed set 300-6500 rpm and timer set 1-99 min minimum.	1 No.
15.	Hot Air Oven	a) Stainless steel, tripled wall in construction, inner chamber made of heavy gauze SS sheet, middle wall and outer wall jacket made of steel sheet finished with moisture proof and heat resistant silver ash hammer tone spray paint. Space between the walls of chambers and door adequately insulated with best quality fiber glass wool. Thermostat control, temperature range 50 to 300 <sup>0</sup> C, digital controller cum indicator, complete with thermometer and connection cord etc. with a work space of about 0.5m x 0.5m x 0.5m.	1 No.
		b) Working Size: 0.75 x 0.75 x 0.75 m, Stainless steel Tripled wall in construction. Inner Chamber made of heavy gauge ss sheet. Middle and outer wall made of sheet finished with moisture proof and heat resistant silver ash hammer one spray paint. Space between the wall Chamber and door should adequately insulate with best quality fiber glass wool. Thermostat control. Temp range -50 to 300 <sup>0</sup> C, Digital indicator with control.	1 No.
		c) Stainless steel, tripled wall in construction, inner chamber made of anodized aluminum or Stainless Steel or outer of mild steel or Sheet Steel. It should be flush fitting insulated door with magnet gasket. Full view glass door should be provided with inner Acrylic door. Temperature range about 5 <sup>0</sup> C to 60 <sup>0</sup> C; Operating sensitivity should be approx. 0.5 <sup>0</sup> C; Temperature control should be by thermostat and complete with 3 removable and adjustable shelves, forced air circulation and digital thermometer. The approx internal should be of 90 (H) x 60 (W) x 60 (D) cm and capacity about air circulation.	1 No.
16.	pH Meter	a) Bench top pH/ORP/Temp meter. Auto calibration and automatic temperature compensation, Simultaneous display of pH, ORP and temperature. LCD display, Resolution: 0.001/0.01/0.1 pH Accuracy: +/- 0.005, pH range 0 to 14.0 or higher, ORP range ± 1999.9 mV, Temp range - -5 to +105 <sup>0</sup> C, output via RS-232 and recorder, complete with compatible combination electrode, stand, cable and other accessories, operational voltage 220 v AC direct or with adapter.	2 No.
		b) Measuring method: glass electrode, Range – 0.00 to 14.0, Readability pH – 0.01, Temperature – 0-100 <sup>0</sup> C, Calibration – up to 3 points, Water proof, Electronic display.	1 No.

17.	Autoclave	a) Vertical type, Capacity: 50 – 60 liters, Size of the chamber: 350 x 350 mm, With Pressure control device, digital temp indicator. Innerline, outline and lid made of stainless steel.	1 No.
		b) Vertical, 50/60 L capacity with digital temperature indicator, pressure gauge, release valve and other standard fittings.	1 No.
18.	Pressure cleaning system	Standard model with all accessories for cleaning cattle shed floor and drain with the effective working pressure of 1000-2000 psi.	1 No.
19.	Ion Selective Electrode	<p>a) <b>Fluoride Ions:</b> Solid state membrane and Rugged plastic shaft, Measurement range – 1.0 ... 0.000001 mol/L, Shaft materials: Non-breakable POM, Temperature range – 0...80<sup>0</sup>C, Optimum pH range – <b>3...12</b></p> <p>b) <b>Nitrate Ions:</b> Solid state membrane and Rugged plastic shaft, Measurement range – 1.0 ... 0.000001 mol/L, Shaft materials: Non-breakable POM/PVC, Temperature range – 0...60<sup>0</sup>C, Optimum pH range – <b>2.....12</b></p> <p>c) <b>Ammonium Ions:</b> Solid state membrane and Rugged plastic shaft, Measurement range – 1.0 ... 0.000001 mol/L, Shaft materials: Non-breakable POM/PVC, Temperature range – 0...50<sup>0</sup>C, Optimum pH range – <b>2.....10</b></p> <p>d) <b>Chloride Ions:</b> Solid state membrane and Rugged plastic shaft, Measurement range – 2.0 ... 0.000001 mol/L, Shaft materials: Non-breakable POM, Temperature range: 0-80<sup>0</sup>C, Optimum pH range – <b>2....13</b></p>	4 No.
20.	Laminar Air Flow	* Dimension: 1200 x 600 x 650, * Air Volume (Approx.): 1350m <sup>2</sup> /h, * Controller: Microprocessor LCD display, * Air Velocity: 0.35-0.50m/sec, 9 stage air velocity control, * Timer: 99 hr 59 min 59 sec, Total using time, * Filters: HEPA Filter 0.3µm Particle Removal 99.97%, Purity class: 100, * Illumination: FL Lamp 40w x 2EA, * Material: Inner – Stainless steel, Outer – Powder coated steel, * Door – Temp safe sliding glass door, * Refrigeration: ½ HP, * Safety: Over current & its leakage Breaker.	1 No.
21.	Ice Cooler (Mini)	The mini cooler should keep reagents and enzymes cool and should protect samples from temperature fluctuations in the freezers due to power outages. It should hold 1.5 ml tube in 32 places and should have gel filled cover.	1 No.
22.	Digital conductivity meter	Range: 0-200 µs, 0-2, 0-20, 0-200 ms; Accuracy: ± 1% fs ± 1 digit; Resolution: 0.1 µs; Cell constant: adjustable; Temperature compensation: 0-50 <sup>0</sup> C; Sensor: conductivity cell; Readout: 3½ digital LED display; Power: 230v ± 10% AC, 50 Hz; Weight: 3.0 kg (approx.).	1 No.
23.	Microwave oven	Capacity: 20 lit., High quality ISI marks.	1 No.
24.	Universal Hand Moisture Testing Machine	Microprocessor based LCD Display showing moisture percentage with temperature date and time with the facility of calibration check, error correction and auto calibration, Automatic temperature compensation with temperature sensor, Moisture percentage range about 12-20%, Consistency ± 0.5% with data logging and data storage capacity of about 200 recordings.	1 No.

25.	Binocular Microscope with camera	<ul style="list-style-type: none"> <li>• Magnification: 10 – 1500x</li> <li>• Illumination: 20 – 30 W halogen lamp, optional external, battery operated illumination.</li> <li>• Eyepiece tube: digital imaging head, Trinocular tube</li> <li>• Eyepieces: FOV 20mm minimum, 10x, 15x (lenses should be anti-fungus type)+</li> <li>• Nosepiece: 4-6 position</li> <li>• Objectives: CP-Achromat, A-Plan, Achroplan 4x (NA 0.10 mm), 10x (NA 0.25 mm), 40x (NA 0.65mm), 100x (NA 1.25 mm)</li> <li>• Stage: Alumite coated surface, ergonomic stage drive, height and tension should be adjustable, x-y movable.</li> <li>• Application: Bright field, Dark field, Phase contrast, Polarization contrast, Fluorescent contrast microscopy.</li> <li>• Adapter for digital camera</li> <li>• Completer with compatible digital camera (up to 4-5 mega pixel minimum with removable storage media, CF Card II, 128 MB, with a up to 4x wide angle zoom lens, programmed auto, shutter priority auto, aperture priority auto and manual exposure control modes, fast, accurate five area multi auto-focus, TTL metering: multi-segment, center-weighted, spot and AF spot, shutter speed 10 min to 1/2000 sec and bulb setting, long rechargeable battery life, 110 min or longer, high quality LCD monitor, movie mode, time lapse move mode, playback options- frame, thumbnail, slide show, movie, USB interface).</li> <li>• Digital imaging software compatible to the camera supplied and the microscope.</li> </ul>	1 No.
26.	Mechanical Shaker (End to End)	Reciprocating shaking motion, Electronic speed control, constant speed with independence of load, shaking platform made up of stainless steel, AC motor with overloaded protection, Loading capacity: 15 kg, Shaking speed: 20 - 200 stocks per minute, Timer, Shaking platform: 500 mm x 500 mm.	1 No.
27.	Digital Vernier Calliper	Range: -- 0-300 mm / 0-30 cm, Resolution: 0.01 mm, Units: mm & cm, <b>Display: Direct read out &amp; digital LCD display</b> , Power: Battery and at least two years of battery life, Origin set: -- It should keep track of its origin point once set a display the actual slider position whenever turned on, Depth & Jaw: - 50 mm.	1 No.
28.	Power operated Lawn Mower	18” to lode.	1 No.
29.	Heavy Duty Thresher	a) Heavy duty for wheat threshing by 35 H.P. Tractor, Output 3-5 quintal/ha.	1 No.
		b) Heavy duty Thresher for 35 HP tractor mounted, standard & reputed brand make alongwith all required access. For use during Potato Sowing.	1 No.
30.	Potato Planter	Two rows planter suitable for attachment with 35 H.P. Tractor.	1 No.
31.	Cultivator	Nine tines cultivator spring loaded under frame clearance 500 mm for more.	1 No.
32.	Disc Harrow	Two rows disc, seven disc for each row.	1 No.
33.	Water tanker (3000 ltr. Cap.)	<b>8 gauge</b> MS Sheet make with the provision of carrying by tractor alongwith Tap & Cover facility.	1 No.