

## SCOPE OF WORK

### TECHNICAL SPECIFICATIONS OF ITEM FOR ERECTION OF “TISSUE CULTURE LABORATORY” [Area Required (2.0 Acre)]

S. N.	Equipment	Specification	Quantity (Unit/Area)
<b>1.</b>	<b>Infrastructure</b>		
	<b>Laboratory Area</b>	<b>ANNEXTURE-1</b>	
	<b>Sterilize and Semi-sterilize Area</b>	<ul style="list-style-type: none"> <li>Media Preparation &amp; Chemical Storage Room</li> <li>Sterilization Room</li> <li>Buffer/Change Room</li> <li>Media Storage Room</li> <li>Inoculation Room</li> <li>Culture Room</li> <li>Bottle Storage Room</li> <li>Store room</li> <li>Packing room/ pre-hardening area</li> </ul> <b>(Annexure-1)</b>	<b>Covered area (Approx.) 450 Sq.M.</b>
I.	<b>Non-Sterilize Area</b>	<ul style="list-style-type: none"> <li>Bottle Washing Area</li> <li>Hand &amp; Leg wash Area</li> <li>Wash Room</li> </ul>	
<b>2.</b>	<b>Primary Hardening Facility</b>	Primary Hardening Unit / Green House ( <b>Annexure- 2A</b> )	<b>1500 Sq.M.</b>
<b>I.</b>	<b>Secondary Hardening Facility</b>	Secondary hardening unit ( <b>Annexure- 2B</b> )	<b>4000 Sq.M.</b>
<b>3.</b>	<b>Glassware and Plastic-ware</b>		
I.	<b>Bottle with caps</b>	Glass bottle 300ml capacity with wide mouth culture bottles with autoclavable plastic lid	<b>80000 Nos.</b>
II.	<b>Growth Room Tray</b>	Trays needed for keeping the bottles	<b>1250 Nos.</b>
III.	<b>Plastic/ Glass Beakers</b>	All lab use size containing 5 No. each	<b>2set</b>
IV.	<b>All glass measuring equipment</b>	All lab use size containing 1 No. each	<b>1 set</b>
V.	<b>All Plastic measuring equipment</b>	All lab use size containing 1 No. each	<b>1 set</b>
VI.	<b>Conical flask</b>	Capacity of different size litres: 3 each	<b>1 set</b>
VII.	<b>Test tube</b>	Glass test tube	<b>200 Nos.</b>
VIII.	<b>Petri plates</b>	Glass Petri plates, Sterile Dia: 90mm x Hight: 14mm	<b>50 Nos.</b>
		Glass Petri plates, Dia: 60mm x Hight: 14mm	<b>10 Nos.</b>
		Glass Petri plates, Sterile Dia: 120mm x Hight: 14mm	<b>10 Nos.</b>

IX.	<b>Glass reagent bottles with screw cap</b>	Capacity 100ml, 250ml, 500ml, 1000ml, 2000ml- 5each	<b>1 set</b>
X.	<b>Amber coloured glass reagent bottles</b>	Capacity 100ml, 250ml, 500ml, 1000ml, 2000ml- 5each	<b>1 set</b>
XI.	<b>Volumetric flask</b>	Capacity 100ml, 250ml, 500ml, 1000ml- 2each	<b>1 set</b>
XII.	<b>Glass test tubes</b>	60 ml	<b>1000 Nos</b>
XIII.	<b>Multipurpose utility tray</b>	Plastic, perforated tray	<b>50 Nos</b>
XIV.	<b>Multipurpose utility tray</b>	Plastic tray	<b>50 Nos</b>
<b>4</b>	<b>Metalwares and Labwares</b>		
I.	<b>Laboratory Spatula, 6" S.S.</b>	Stainless steel, 6" spatula, pack of 6	<b>6 set</b>
II.	<b>Long forcep</b>	Size 12", stainless steel, pack of 6	<b>6 set</b>
III.	<b>Scalpel holder</b>	Stainless steel	<b>20 Nos</b>
IV.	<b>Spirit lamp</b>	Stainless steel	<b>12 Nos</b>
V.	<b>Scissor</b>	Stainless steel,"6	<b>12 Nos</b>
VI.	<b>Scalpel blades</b>	Stainless steel, No. 11, pack of 30	<b>2 set</b>
VII.	<b>Beaker tongs</b>	Stainless steel with plastic grip	<b>3 set</b>
<b>5</b>	<b>Furniture and Office supplies</b>		
I.	<b>Lab furniture</b>	Executive Chair: 10 Nos Computer Chair: 5 Nos Computer Table: 5 Nos Laminar Chair: 24 Nos Visitor Chair: 20 Nos Office Table: 3 Nos Shoe Rack: 4 Nos Writing Board: 4 Nos Conference Table Set: 1 Nos Misc: 1 Nos	<b>1 set</b>
<b>6.</b>	<b>Miscellaneous other items</b>		
I.	<b>Apron, cap mask &amp; gloves</b>	Lab Apron- 20 Nos. Caps- 20 Nos. Mask-20 Packet. Gloves- 20 Packet.	<b>20 Nos. Each</b>
II.	<b>Slipper</b>	Standard Rubber slipper	<b>15 Nos.</b>
III.	<b>CCTV Full HD for monitoring of lab</b>	16 Channel hd Monitor -1 No. 1.3MP. Camera - 16 Nos. 4TB Surveillance HDD- 1 No. Power Supply 05A (Linias)- 3 No. 3+ solid copper wires- 1No. Bnc Connector-32Nos. Dc connector- 16 nos. Rack-1No.	<b>1 Set</b>

		Installation- 16 Camera	
IV.	<b>Computer and Printer</b>	<p>PC with 21" LCD monitor, (Dell/Lenovo/ HP/ Acer make) are built specifically for the unique needs of small businesses and are ready to be customized with the features and software you want. The Computer is a powerful, secure and reliable desktop solution that's optimized to meet your high performance business demands.</p> <p><b>Printer:</b> HP laser Jet Colored printer</p>	<b>1 Set</b>
V.	<b>Water Tank</b>	PVC Tank capacity 20000 Ltrs. with tank platform	<b>1 No.</b>

#### 6. Equipment:

S.No.	Items	Specifications	Qty.
1.	<b>Autoclave (Fully Automatic) Horizontal Bench-top Autoclaves (Front Loading) 1200 Ltr.</b>	<p>Horizontal, front-loading autoclave <b>HORIZONTAL BENCH-TOP AUTOCLAVES SYSTEC D SERIES</b></p> <ul style="list-style-type: none"> <li>For all laboratory applications even for sophisticated state-of-the-art sterilization processes. With all possibilities to add additional options for process optimization to enable valid a table sterilization to be carried out.</li> <li>Corrosion resistant pressure vessels made of stainless steel 1.457 AISI 316 Ti, with the housing and support frameworks made of steel as well.</li> <li>Temperature sensor in addition to an electronic pressure sensor to monitor both the pressure and temperature</li> <li>Front-loading bench top Horizontal autoclaves with 150 liters chamber volume is distinguished by its small footprint and high chamber capacity. Result: optimal loading capacity with most standard media bottles and Erlenmeyer flasks.</li> <li>The door as well as various other elements of the housing and vessel are built using stainless steel and clad in an aesthetically pleasing front cover is made of insulated plastic that is highly resistant to heat. The same material is used for the control panel, display as well as parts of the control processing system. This prevents operators from coming into contact with heated surfaces.</li> </ul>	<b>1 No.</b>
2.	<b>Electronic Weighing Balance (Readability 0.1mg)</b>	<p>Weighing capacity: 220g Readability: 0.1mg Repeatability: 0.1mg Linearity: 0.2mg Weighing pan size: Ø90mm</p>	<b>1 No.</b>

		Weighing chamber height: 209mm Net weight, approx. : 4.9kg Dimensions, D x W x H : 360 x 216 x 320mm; 14.1 x 8.5 x 12.6Inch	
3.	<b>Electronic Weighing Balance (Readability 1.0mg)</b>	Weighing capacity : 310g Readability: 1mg Repeatability: 1mg Linearity: 2mg Weighing pan size: Ø120mm Weighing chamber height: 209mm Net weight, approx.: 4.9kg Dimensions, D x W x H : 360 x 216 x 320mm; 14.1 x 8.5 x 12.6Inch	2 Nos.
4.	<b>pH meter cum conductivity meter (Digital)</b>	Eutech pH 700 Meter: with pH Electrode (ECFC 7252101B), ATC Probe (ECPHTEMPB01P) Integral Electrode Holder & 100/240 VAC Adapter  <b>pH :</b> Range : -1.99 to 16.00 pH Resolution: 0.01pH Accuracy: ±0.002 Cal. Points: Up to 5 points Buffer Sets: USA, NIST  <b>ORP:</b> Range: ±1999 mV Rel. mV Range: ±1999 mV Resolution: 0.1 mV (±199.9 mV) / 1 mV (beyond) Accuracy: ±0.2 mV (±199.9 mV) / ±2 mV (beyond)  <b>Temperature:</b> Range (meter): 0.0 to 100.0 °C / 32.0 to 212.0 °F Resolution: 0.1 °C / 0.1 °F Accuracy: ±0.5 °C / ±0.9 °F Coefficient (Per °C) Compensation Type & Range: Automatic or Manual (0 to 100 °C / 32 to 212 °F) Calibration: Off set in 0.1 ° increments; offset range: ± 5 °C / 9 °F	5 No.
5.	<b>Laminar Airflow/Bio safety Cabinet Class-II (size 5-6 ft)</b>	Thermo Scientific Class II Type A2 4 Feet Biological Safety Cabinet cum Laminar Air Flow with 10 Inches Work Aperture and Smart coat Interiors <b>TECHNICAL SPECIFICATIONS</b> Horizontal type Laminar Airflow Package: Includes cabinet, manual adjustable height stand, factory installed UV light and one set of armrests <b>ERGONOMICS AND UTILITIES</b> Lighting Power : >120 Fc (1200 Lux) Sound Level: < 62 dB(A) <b>Dimensions Exterior without Stand : 6' x 2' x 2'</b> Height of Stand: Min 750 mm Max 950mm	9 Nos.

		<p>External Cabinet Height on Stand: 2320 mm Min; 2520 Max</p> <p>Interior: 1200 W x 780 H x 630 D mm</p> <p>Working Height of Front Window: 10“(254mm)</p> <p>Max. Opening of front window: 21 “ (535 mm)</p> <p>ELECTRICAL DATA Voltage : 230 V</p> <p>Frequency: 50 Hz</p> <p>FILTER SPECIFICATIONS: H14 HEPA EN1822, 99.995% MPPS</p>	
<b>6.</b>	<b>Water Purification System</b>	RO System 1000 LPH with stand & other accessories	1 Nos.
<b>7.</b>	<b>Glass Bead Sterilizer</b>	<p>These are incorporated with a thermostat which maintains the set temperature with an accuracy of + 1 of the preset temperature range.</p> <p>Crucible (Brass) size:2”dia x 5½” Depth</p> <p>Preset Temp. Range: 245°C – 265°C</p> <p>Initial Stabilization Time: 30 Minutes (including. of Glass Beads) 250W Single Phase</p>	9 Nos. (1 for each laminar)
<b>8</b>	<b>Air curtain</b>	MS powder coated body, Slick in design, with auto ON/OFF switch can save upto 80% of Electricity. Max. air velocity at nozzle: 21m/s, Noise Level-DB 50-70, No.of Blowers-3, No. of Motors-2, No-f shaft-1 Double, Voltage- 350w-605w, Phase Single RPM(Max./Min.)-2700/2100, Blower Type-ABS, cfm-825-1490, Insect/Dust rejection-75%	3 Nos
<b>9</b>	<b>Photoperiodic morphogen controller</b>	Analog Photoperi 24 hrs repeat cycle min ON/ OFF period with NICAD battery auto recharging. Powered output can drive 110 tube lights 40 watt directly. Thermal safety 16amp inbuilt. Accuracy $\pm$ 8 sec/day. Operating voltage 220 volt AC	4 Nos
<b>10</b>	<b>Sequential Timer</b>	For operating two air conditioners of 1.5 ton each, Output- Operates two AC upto 1.5 ton each, Min. on/off cycle-30 min.	

11	<b>Autoclave (Vertical Type) One</b>	<ul style="list-style-type: none"> <li>• Double walled.</li> <li>• Inner outer chamber stainless steel.</li> <li>• Lid is made of thick stainless steel.</li> <li>• Pressure adjustable between 5 to 22 P.S.I.</li> <li>• ISI mark heating element, which are easily replaceable and heat the water to desired temperature and pressure.</li> <li>• Pressure is indicated by pressure gauge supplied complete with stainless steel perforated.</li> <li>• Basket cord plug to work on 220v +/- 9% 50Hz, single phase.</li> <li>• Pressure control device (PIEZOSTAT).</li> <li>• Microprocessor based controller with programmable features with PID Display.</li> <li>• PV &amp; SV 16X2 character LCD display, 4 program keys, one start/ stop key, pt-100 3wire.</li> <li>• Sensor, automatic soak, purge, exhaust setting with high alarm set. Automatic Timer.</li> <li>• Size of inner chamber- 450x600 mm.</li> </ul>	1 Nos.
12	<b>Vertical Distillation Apparatus</b>	<ul style="list-style-type: none"> <li>• Capacity 5 Ltr./hr</li> <li>• Quartz distiller, Demountable boiler</li> <li>• Panel box and stand to accommodate regulator clamp etc.</li> <li>• Quality of distillate – pyrogen free, PH-6.9 – conductivity</li> <li>• Distilled water should be heavy metal, salts, pyrogen and iron free.</li> <li>• Specific Conductivity at 25 deg C less than 0.4 X 10.6S/cm Glass material (or Chemical inert material).</li> <li>• Equipment should be thermal shock proof.</li> </ul>	1 Nos
13	<b>Stereo Zoom Microscopes with Camera</b>	<p><b>Zoom body:</b>7:1 zoom microscope body, Galilean Optics. Zoom magnification variation: Left/right optical axis parallel method. Zoom magnification indication: 0.8, 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 5.6.</p> <p>Zoom drive: Horizontal knob system. Click stop for each zoom magnification: ON-OFF switching possible. Objective mounting: Screw mounting into thread.- 1 no.</p> <p><b>Observation Tube:</b>30 degrees inclined trinocular observation tube with 2 step light path selection: 100:0 &amp; 50:50 - 1no.</p> <p><b>Digital Colour Camera:</b> 5.1 Mega pixels digital camera, sensor size: 1/2.5", binning: 2x2, 4x4, Spectral Range: 380-650 nm with IR filter, integrated metal alloy housing, USB interface. Compatible adaptor included – <b>1 no.</b></p>	<b>1 No.</b>
14	<b>Bottle Washing Unit</b>	Bottle washing unit- High-performance Cleaning Outstanding fast cycle and high-	<b>1 No.</b>

		<p>Performance cleaning results from efficient direct injection washing. High performance pump ensure high flow rate of water. Efficient water spray pressure bring about better and Faster cleaning. Water, liquid detergent and distilled water automatically injected by program washing cycle. Safety Door Lock Door is automatically locked for user safety when washing cycle starts. Compact, Robust Design &amp; Efficient Construction Compact design for space saving and maximize working capacity in laboratory. Double layer structure ensures soundproof and heatproof during operation.</p> <p>Built-in-steam condenser prevents steam to enter into the laboratory. Telescopic sliding rails ensures safe and easy to load and unload.</p>	
15.	<b>Peristaltic pump for media dispensing</b>	<p>Peristaltic pump for media dispensing Specifications Flow rates 0.7 to 6000 ml/min Dispensing volume.</p> <p>External control start/stop control, direction control, flow rates control (0 - 5V ,0 -10V, 4-20 mA , 0-10KHz optional)</p> <p>Output interface start/stop, direction output and 0-10KHz frequency output Communication interface RS 485 Power AC 176 - 264V, 50/60 Hz Power consumption &lt;140W, Operating condition Temperature 0 to 40°C, Relative humidity &lt; 80%</p>	<b>2 Nos.</b>
16.	<b>Magnetic Stirrer with Hot Plate</b>	<p><b>18.4x18.4cm</b></p> <p>Speed Range : 50 to 1500rpm</p> <p>Temperature Range (Metric) : 300°C (Max Temperature)</p> <p>Top Plate Material : Aluminum Surface Area (Metric)</p> <p>Heating : 18.4 x 18.4cm</p> <p>CE Shipping Weight (Metric) : 5.5kg</p> <p>Stirring Range : 50 to 1,500rpm</p> <p>Dimensions (L x W x H) : 13 x 8.2 x 3.8 in. (33 x 20.8 x 9.7cm)</p> <p>Max. Temperature (Metric) : 300°C</p> <p>Electrical Requirements:230V 50/60Hz</p>	<b>2 Nos.</b>
17.	<b>Media Cooking Unit</b>	<p>Media preparation Vessel</p> <p>Capacity- 25 liter</p>	<b>1 No.</b>
18	<b>Growth Room Racks (18 Racks / Room) with cool LED Light (Size 8 x 4 x 8-9)</b>	<p>Growth room Racks with cool LED Light</p> <p>Light weight structure. Size (HxLxB): 8x4x 8-9 feet. 5 shelves in each rack and fitted with at least LED light. Racks are fitted with wheel for easy movement.</p>	<b>18 Nos.</b>
19	<b>Trolleys</b>	<p>SS Trolleys for Material Movement</p> <p>914 x 610 x 750 mm ( W D H ) * MOC – SS 304 * Matt Finish * Wheels For Movement * Rack For Storage And Movement</p>	<b>6 Nos.</b>
20	<b>Diesel Gen set (110 KVA)</b>	<p>A. <b>DIESEL ENGINE:</b> 110 KVA, 4 cylinders, inline, 4 stroke cycles, Liquid cooled, developing 126.00 BHP at 1500.00 RPM under NTP conditions of BS: 6. The engine shall be provided with electrical starting arrangement &amp;</p>	<b>1 No.</b>

		<p>shall give the electrical output of 100KVA/80KW at 0.8 power factor, 415Volts at the alternator terminal. The Engine is fitted with the following standard accessories 01. A1 class Mechanical 02. Battery Charging Alternator 03. Engine safety Sensors (LLOP &amp; HWT) 04. Air Cleaner 05. Lube Oil Filter 06. Fuel Filler</p> <p><b>B. ALTERNATOR:</b> 100KVA/80.00KW, alternator, 3 phase, 415V, 0.8 PF, type, screen protected, revolving field, self-excited, self-regulated through an AVR. Permissible overload of 10% for one hour in 12 hours of operation.</p> <p><b>C. CONTROL PANEL:</b> The Control Panel is manufactured with 16/18 gauge CRCA sheet and is powder coated for a weather-proof and long lasting finish. The Control Panel consists of Microprocessor based SEDMEC electronic controller, MCCB of suitable rating, Key Switch, Push Button (starter), LED: Battery Charging alternator fail indication, Current Transformer, Instrument fuses. The microprocessor electronic controller displays the following parameters: Voltage, Frequency, Current, Rpm, Cumulative Run Hours, Oil Pressure, Coolant Temperature &amp; Charging Current (DC Amp Meter). The microprocessor electronic controller provides the following safety to the engine: Under &amp; Over Voltage, Under &amp; over Frequency, Under &amp; Over Speed, Overload, Low Lube Oil Pressure, and High Coolant Temperature &amp; Emergency Off.</p> <p><b>D. ESSENTIAL ACCESSORIES:</b> Fuel tank: Sub Base Fuel tank (DRAW IN TYPE) of MS sheet of adequate capacity. • Base Rail: Base Rail of adequate size is provided. • Batteries: For electrical control circuit 2 no, 24 Volts, Suitable sized battery for electrical starting of DG set</p>	
21.	<b>Dissecting kits and Inoculation Instruments</b>	DR Instruments Anatomy Dissecting kit.	<b>12 No.</b>
22.	<b>Refrigerator Vertical (4°C)</b>	<ul style="list-style-type: none"> <li>• Capacity: 165 liters</li> <li>• For 220/230 V, 50/60 Hz, Operation</li> <li>• Temperature Range: 0-10°C</li> <li>• Door: Yes</li> <li>• Wheel: Yes</li> <li>• No. of Shelves/Baskets: 4</li> <li>• Door: 1</li> <li>• Dimension: 31" H x 26" D x 74" H</li> <li>• ISO Certified product with built-in fan</li> <li>• CFC Free refrigerant, fan cooled condenser, internal fluorescent light.</li> <li>• Audio defrosting facility</li> <li>• CFC-Free with external thermometer</li> <li>• Interrelated lock, Castors at back of cabinet and adjustable feet at front</li> </ul>	<b>2 Nos.</b>



		<ul style="list-style-type: none"> <li>Puff insulation with cyclopentane.</li> </ul>	
23.	<b>Micro Wave Oven</b>	Make: Samsung/IFB or Equivalent Capacity 30 Ltr.	<b>1 No.</b>
24.	<b>Hot Air Oven (Capacity 100Ltr.)</b>	These mechanical convection ovens are perfect for heating and drying applications in research or industrial environments. Featuring the Memmert control cock pit for quick and intuitive control with simple touch, turn and go operation. Durable construction with a scratch-resistant Structured stainless steel exterior and easy-to-clean corrosion-resistant stainless steel interior. Recessed grips make oven easy to carry and handle and stainless steel door can be changed from left to right side opening.	<b>1 Nos.</b>
25.	<b>Rotary Shaker</b>	Designed for continues shaking of solutions in Erlenmeyer Flasks from 50ml-1000ml capacity. It is a compact beach type table top model with platform fitted with rubber discs mounted on ball bearing crank shafts to give an orbital motion to the flasks, within a diameter of approximately 2". The motor is coupled by means of a V-belt with pitch pulley, and is mounted on a heavy and sturdy angle iron frame S.S top. Speed is controlled by mechanical Speed controller. To work on 220/230 Volt A.C. supply. PLATFORM SIZE- 65 X65CM 36 FLASK OF 250ML, Motor capacity- 0.50 HP	<b>2 Nos.</b>
26.	<b>Lab Clothes</b>	Lab cloth make Hi-media	<b>20 Nos.</b>
27.	<b>Media Storage Rack</b>	Media storage Racks Body made by Mild steel outer body powder coating front glass to view	<b>10 Nos.</b>
28.	<b>Micro-pipettes different size</b>	<b>Make: Thermo Fisher Scientific</b> <b>Model: Fin-pipettes</b> 1-10 $\mu$ l -4 Nos. 20-200 $\mu$ l -4 Nos. 100-1000 $\mu$ l -4 Nos. 1-5 ml -4Nos.	<b>4 Nos. each</b>
29.	<b>Label Gun</b>	Two Row, eight space, all alpha numerical	<b>4 Nos.</b>
30.	<b>Electric ON/OFF LPG Gas Burner</b>	Make –Sun flame or Equivalent	<b>10 Nos.</b>
31.	<b>Sealing Machine</b>	Sealing Machine Foot operated	<b>1 No.</b>
32.	<b>Cutting Equipments</b>	Cutting Equipment for tissue culture lab	<b>25 Nos.</b>
33.	<b>Shaker with 8 Ltr. Capacity</b>	Features: § Energy efficient § Durable & Low maintenance, along with following specifications: § Scientifically designed for mixing, diffusion, VDRL test & development of cultures. § Heavy base & compact design for continuous use. § Heavy Removable/ Interchangeable S. Steel platform with Lotus clamp to hold various capacity conical flasks. § Digital control with RPM Indicator. § Power 230V, AC, 50Hz, Mains.	<b>2 Nos.</b>
34.	<b>HVAC System</b>	Split type Air Conditioner 2.0 ton capacity 4-5 star, standard make	<b>11 Nos</b>
35.	<b>Biotech Heater</b>	For heating in winter 2.1 kw Biotech heater	<b>12 Nos</b>
36.	<b>Fogger Machine</b>	Hand Fogger machine fully Stainless Steel	<b>1 No.</b>

37.	Allium Ladder	Aluminum Ladder	2 Nos.
38.	Lux meter	Digital Lux Meter	1 No.
39.	Humidifier machine	S.S. Body, Capacity 10 Litres Based on the rotating disc-splash plate principal. It produces only super fine particles of micron size, which become part of the atmosphere, Due to the upward thrust imparted to the micron size water droplets, by high speed motorized unit, they remain suspended in the atmosphere for longer duration of time. The unit body is made up of S.S. To work on 220/230 volts A.C. Supply.	5 No.
40.	Grading & Packing Table	Complete table is made on Stainless Steel 304 body. size 3ft x 4 ft.	1 No.
41.	Exhaust and ceiling fans	Electrical Exhaust and ceiling fan	5 Nos.
42.	LPG Cylinder	<b>Make: Bharat/Indene/HP</b> LPG gas Cylinder with filled LPG gas	2 Nos.
43.	Servo Stabilizer	Stabilize electricity as required capacity	1No.

#### ANNEXURE-1

##### PRE ENGINEERED STRUCTURE

Proposes to furnish a pre-engineered steel building (s) as described below. The building will consist of all components required to construct the primary and secondary framing (wind bents, wall & roof purlins) plus the wall and roof cladding. Hardware's of the building are included.

Interior partition walls, electrical, plumbing, cooling, heating, foundation, masonry walls, concrete floor or materials are also included.

##### GENERAL FEATURES:-

Type: TCCS (tapered column clear span)

Width: 15.85 m o/o of steel column or as per land available

Length: 24.00 m o/o of steel column or as per land available

Eave height: 4.88 m clear under the knee.

Width module: 1@15.85 m

Roof slope: 1:10

Bay spacing: 5@7.62 m

Front end frame: rigid & bearing

Rear end frame rigid & bearing

Type of bracing on roof & wall: diagonal rod bracing/angle bracing

Roof panel: 0.45mm bare galvalume profiled sheets.

Wall panel: 0.50mm colour coated galvalume sheet above brick wall.

Girts: side wall girt & end wall girt are mounted on the exterior face of the column.

Fasteners: mechanically galvanised hex- head self drilling fasteners with integral epdm seals.

Accessories: ridge cap, eave gutter & down spouts matching to roof colour.

Paint finish: all primary and secondary members shall be supplied with factory applied one coat of zinc chromate red oxide primer and 2 coats of synthetic enamel paint on structure applied at site.

Building: condition enclosed

##### DESIGN LOADS (LIVE / WIND):-

Live load: 0.57 kn/m

Wind speed: 47 m/sec (as per is 875 part iii) 1987

Seismic zone [zone (z)]: iv (0.24) (as per is 1893) 2002

**DEFLECTIONS:-**

Vertical: 1/180

Lateral: eh/100

Purlins 1/180

**INCLUSIONS:-**

- Interior, partitions with puff panel 60mm thick 32kg density, doors and fixtures.
- Roof fans, pipe flashing, curbs.
- Wall vents, fans, doors, windows and louvers.
- Civil, Mechanical and Electrical design and materials.
- Concrete embedded plates or weld plates of any kind.
- Foundation and masonry design/ work/ materials.
- Setting of Anchor Bolt – (Physical setting or fixing). ASSPL will only check dimensional accuracy of anchor bolt set out.
- Grouting – Grouting under column base plates with high strength grout. Electricity & Water required during work at site.

**ANNEXURE-2A****1. Hi-Tech Greenhouse**

S. N.	Head	Description	Qty
1.	<b>Hi-Tech Poly House</b>	<b>Primary hardening</b>	<b>1 No.</b>
	Total Area	<b>1500 Sq.M</b>	
	Length/ Width	<b>As Per site requirement</b>	
	Ridge Height	6.0 m	
	Gutter Height	4.0 m	
	bay Size	4.0 x 9.6m	
2.	<b>Entrance:</b>	Double doors with polycarbonate sheets, second door should be sliding and made of aluminum section (3 m x 2.10 m x 2.40 m) with provision for disinfection pit/ foot bath.	
3.	<b>Structure</b>	ISI marked G.I pipe structure 2mm thick, & nut bolts etc all pre-galvanized (hot dipped). GI Pipe of Size 96x48mm, 60mm, 48mm, 42mm and 32mm OD or 48 x 48mm, 38 x 38mm, 32 x 32mm.	
4.	<b>Covering</b>	U. V. stabilized Polyethylene film 200 micron thickness, Anti drip/ fog, Diffused (Multilayer) for covering. - Five-layers polyethylene film (Israel Technology)	
5.	<b>Internal Screen Net</b>	Inside 50% white shade net, with manual gear system and shade Net outside, UV stabilized 50% Fixed.	
6.	<b>Air curtain</b>	3' wide installed above door with auto ON/OFF switch attached with door - One	3 Nos
7.	<b>Cooling System</b>	By providing following system by which temperature can be lowers by $10^{\circ} \pm 2^{\circ}\text{C}$ from outside when outside maximum humidity 62% of low and temperature $35^{\circ}\text{C}$ or above	
8.	<b>Cooling pad complete</b>	Pad Area: 52.0m L x 1.5m H x 100mm thick. 7090/50 Framing material of Aluminum required supporting distribution & returning piping. Plastic Profiles: Water Distribution tray Gutters, down spout end caps & drip pan, plumbing kit, Pump 220 volt single phase 50	

		<p>cycles, Drilled PVC piping cap, pad retainer, all suspension hardware, At velocities of 1 to 3 M/s to give efficiency from 60 to 95% Filtration: Mesh SS filter for 30 m efficiency.</p> <p>Miscellaneous: Fasteners, Galvanized, Rivet- Aluminum. Pump: Mono block as per requirements</p> <p><b>Fan:</b> Axial flow belt driven net protected</p> <p>Sweep Size: 48"</p> <p>Blade: 6 nos. SS</p> <p>Motor: 1.5HP</p> <p>Qty: 10 Nos</p> <p>Louvers : auto open able</p>	
9.	<b>Fogging System</b>	<p>To increase the humidity up-to 70% <math>\pm</math> 5% by providing following system,</p> <p>Nozzles : Micro fogging hanging type,</p> <p>Lateral pipe : 16 mm LDPE,</p> <p>Water Particle : 80-100 <math>\mu</math></p> <p>Filter : online Disc</p> <p>Pipe : 40/63mm PVC 6 kg/cm<sup>2</sup></p> <p>Pump : 3.0 HP</p> <p>Nozzles spacing : 2.5 x 2.5m,</p> <p>Discharge : 28-30 lph at 4bar pressure</p> <p>Pipe &amp; fitting : All necessary PVC pipes 40-63mm, valve and fixtures as required</p>	
10.	<b>Green House Environmental Monitoring Unit</b>	<p><b>Control Panel:</b> Microprocessor based controller which includes temperature, humidity and photoperiodic monitoring &amp; controlling system. Temperature: <math>\pm 2^{\circ}\text{C}</math>, Humidity: <math>\pm 5\%</math>, Time: <math>\pm 5\text{sec/day}</math>.</p> <p><b>Operation system:</b> Programmable/ user selectable</p> <p>Temperature: Cooling &amp; Heating to set</p> <p>Humidity: Humidifier / Fogging to set</p> <p>Light: RTC Based ON/OFF</p> <p>Mounted in CRC powder coated panel fitted with contactor, relay, MCB and preventers. All power supply used for this system.</p> <p><b>Sensor:</b> Temperature, Humidity 4-20mA</p> <p>Temperature Range: 0-100<math>^{\circ}\text{C}</math>, <math>\pm 1\%</math></p> <p>Humidity Range: 0-100 %RH, <math>\pm 1.8\%</math></p>	
11.	<b>Heating System</b>	Biotech Heat Convactor electric heating system 2.1 KW completes circulation system to give uniform heat so that the heat can be blown in the complete area to increase temperature. (15 nos.)	
12.	<b>Electric Fitting</b>	Complete electrical wiring of green house with copper wire ISI marked, MCB/ main switch, light/ power points for pump/ fans as per requirement. Electricity outlets (3/1 phase) as per requirement.	
13.	<b>Foundation</b>	Telescopic below the ground level with block size 3' x 1.25' x 1.25' (in cement concrete 1:2:4 mix of cement, sand and bajri gravel.	
	<b>Low Tunnels</b>	Tunnel covered with polythene sheet as per requirement in whole green house.	
14.	<b>Floor</b>	The floor should be cemented and not natural soil with cover.	
15.	<b>Bricks wall</b>	With 1st class in 1:6 CM, with PCC: in foundation 1:5:10, all side of the Green House 60cm above GL & 30cm below earth surface with plaster in 1:4 CM (1cement, 4 fine sand). Painting with 2 or more coat of cement paint of approved colour/shade	
16.	<b>Bench</b>	GI Bench top covered with GI welded mesh. Qty as pre required	

## ANNEXURE-2B

**1. Secondary Hardening Chamber/ Shed Net House:**

S.N.	Head	Description	Qty.
1.	Shade Net House	Secondary hardening Unit	1 No.
	Total Area	4000 m <sup>2</sup>	
	Length/ Width	As per Site	
	Ridge Height	Flat roof	
	Gutter Height	04.0 m	
	Span/ bay	5 x 4 m	
2.	Entry Room	Double door type ante room size 3m x 2m with proper locking system door covered with 6mm polycarbonate sheet covering.	
3.	Structure	G.I pipe structure 2mm thick, & nut bolts etc all pre-galvanized (hot dipped). GI Pipes: 60mm, 48mm, 42mm & 32mm± 1mm or 48 x 48, 38 x 38 x 32 x 32mm.	
4.	Net	Net would be UV stabilized, HDPE, and green colour 50% shade net, 90 GSM	
5.	Fixing	fixing of net to the structure with GI profile & spring insert or pasting wherever required	
6.	Civil work	foundation telescopic below the ground level with block size 2.5' x 1.0' x 1.0' (75x 30 cm X 30cm) All civil work will be done in ratio 1:2:4 cement, sand, bajri gravel	
7.	Fogging & Drip Irrigation System	To increase the humidity up-to 70% ± 5% by providing following system, Nozzles : Micro fogging hanging type, Lateral pipe : 16 mm LDPE, Water Particle : 80-100 µ Filter : online Disc Pipe : 40/63mm PVC 6 kg/cm <sup>2</sup> Pump : 1.0 HP Nozzles spacing : 2.5 x 2.5m, Discharge : 28-30 lph at 4bar pressure Drip Irrigation: Drip Lateral : 16 mm LLDPE s class 2, Discharge : 2/ 4 lph Spacing : 0.60m x 0.30 m (L/L x N/N/ as per requirements)	
8.	Pipe & fitting	All necessary PVC pipes 40-63mm, valve and fixtures as required and Installation of watering system with Pump (ISI make)	
9.	Path/Floor	Natural Soil	

### Detailed BOQ

<b>1</b>	<b>Land Development</b>			
<b>S. No</b>	<b>Particulars</b>	<b>Description</b>	<b>Qty</b>	<b>Unit</b>
1	Land Development	Land leveling, landscaping	1	Set
2	Boring	2 HP submersible	1	Set
3	Main Gate & Guard Room	15' wide and 5' height & one small gate with 18" brick column support and one guard room, Board	1	set
4	Boundary wall	6' Height Chain link Fencing with 1.5' brick wall base above from ground level. 200 M approx.	1	Set
<b>2</b>	<b>Pre Engineered Building</b>			
1	Building	PEB Building as per approved drawing. Cosisting of Storage Room for Chemicals, Washing and Media preparation room, Sterilization room, Inoculation room, Culture room, wash room, passage , door etc	370	Sqm
2	Water Tank	PVC Water tank with cc Platefarm 20000 Ltr	1	Set
<b>3</b>	<b>Equipment</b>			
<b>S. No</b>	<b>Particulars</b>	<b>Description</b>	<b>Qty</b>	<b>Unit</b>
1	Growth Room Racks	complete with LED tube light fitting, timer and correct design for keeping the material	18	Set
2	Auto Clave-Horizontal Type	1200 ltr, Horizontal Type, outer and lid made of stainless steel, radial type closing arrangement	1	Set
3	Auto Clave-vertical	Auto Clave vertical, double walled 450 X 600 mm	1	Set
4	Air Shower	Airshower to remove all dust and a barrier for entry of insect	1	Set
5	Laminar Air Flow –Double	Horizontal Laminar Air flow bench of ftx 6ftx-2ftx2ft. Stainless Steel Top, Gas Cock No.1 Glass/Acrylic side panel.	9	Set
6	Air Conditioner	Air conditioner 2 ton 5 Star quality	11	Set
7	Plant Stacking Trollies	for keeping the plants for cutting	6	Set
8	Positive Pressure Unit	To induct clean air inside the lab	4	Set
9	Automatic Temperature Recorder	Centerlized PLC & HMI Automation system to record & control temp, humidity & light in the greenhouses & Growth room	1	Set
10	Media Preparation Equipment	Stainless Steel vessel 25 ltr	1	Set
11	Glass Bead Sterlizer	tissue culture use	9	Set
12	Water Purifier	1000 LPH	1	Set
13	De Humidifier		3	Set
14	Ultrasonic humidyfier	10l Capacity	5	Set
15	Electronic Balance	1 mg, and 0.1 mg	2,1	Set
16	Bottle Washing Machine		1	Set
17	Media Trolly	for media filling	1	Set

18	Heater	Air heater	12	Set
19	Tray For Bottle Moment		600	Set
20	Air Curtain	3 ft. wide outer cover made of MS duly painted	3	Set
21	Electronic Balance	500gm, Indian make	1	Set
22	pH Meter cum conductivity meter (Digital)		5	No.
23	Refrigerator Vertical (4°C)	165 ltr. Min. Standard make	2	Set
24	U V Light System	complete fitting	1	Set
25	Label Gun	two row, eight space, all alpha numerical	4	Set
26	Fumigation Machine		1	Set
27	Growth Room Tray	trays needed for keeping the bottles in rack	1,250	Set
28	Sealing Machine		1	Set
29	Hygro Thermometer	digital	5	Set
30	Water Cooler		2	Set
31	Magnetic Stirrer	2 ltr capacity	2	Set
32	Mosquito Trap		2	Set
33	Attendance Machine		1	Set
34	Lux Meter		1	Set
35	EC Meter		1	Set
36	Hot Plate		2	Set
37	Peristaltic pump for media dispensing		2	No.
38	Computer	desktop	2	Set
39	Printer (4 In One)	desk & laser	2	Set
40	Stereo Zoom Microscopes with Camera		1	Set
41	Vertical Distillation Apparatus	5 Liter Capacity	1	Set
42	Dissecting Kits and Innoculation Instruments		12	No.
43	Micro Wave Oven	Capacity 30 Ltr, Make Samsung/IFB or Equivalent	1	No.
44	Hot Air Oven	Capacity 100 Ltr	1	No.
45	Media Storage rack		10	No.
46	Cutting Equipments	Cutting Equipments for TC Lab	25	No.
47	Rotary Shaker		2	No.
48	Fogging Machines	Hand Fogger Machines fully stainless stell	1	No.
49	Shaker	Shaker with 8 ltr capacity	2	No.
50	Aluminum Ladder		1	No.
52	Photo Periodic Morphogen controller		4	No.
51	Misc Equipment		1	Set
<b>4</b>	<b>Transformer, Electrical &amp; DG Set</b>			
<b>S.No</b>	<b>Item</b>	<b>Description</b>	<b>Qty</b>	<b>Unit</b>
1	Electric Wiring	Supply and Laying of electrical Aluminium armored cable of rerequired capacity, complete electric wiring Control panel, LT panel etc complete in all respect	1	Set
2	DG Set with shed 110 KVA	DG (110 KVA) with shed & CC Platform, earthing etc complete in all respect.	1	Set

5	Furniture & Fixture			
S.No	Item	Description	Qty	Unit
1	Executive Chair	furniture	10	Set
2	Computer Chair	furniture	5	Set
3	Computer Table	furniture	5	Set
4	Laminar Chair	furniture	24	Set
5	Visitor Chair	furniture	20	Set
6	Office Table	furniture	3	Set
7	Shoe Rack	furniture	4	Set
8	Writing Board	furniture	4	Set
9	Conference Table Set	furniture	1	Set
10	Cupboard	furniture	2	Set
11	Misc Stationary& Other Item	As required	1	Set

6	Chemicals			
S.No	Item	Description	Qty	Unit
1	Blade Handle	Stainless Steel Made	200	Set
2	Chemicals	Various Chemicals Used in Tissue Culture Lab (Lumpsum)	1	Set
3	Agar Agar		100	Set
4	ISO Alcohol		400	Set
5	Forceps	Stainless Steel Made	100	Set
6	Cling Film	Film To Wrap The Bottles	250	Set
7	Lab Coat		40	Set
8	Label Roll		150	Set
9	Gas Burner		1	Set
10	MIS Formats	Misc MIS Complete Set To Cover All Activities	1	Set
11	Fungicide	5 Kg	10	Set
12	Insecticide	5 Kg	10	Set
13	Steel Trays	6"	12	Set
14	Forcep And BP Handle Stand		40	Set
15	Instruction Posters		4	Set
16	Misc Posters		5	Set
17	Cotton		200	Set
18	Aluminum Foil		50	Set
19	P P Bags	In Kg	60	Set
20	Surgical Blade		5,000	Set
21	Face Cap	Lab Wear Reusable (Made of Cloth)	20	Set
22	Face Mask	Lab Wear Reusable (Made of Cloth)	20	Set
23	Regent Bottles		20	Set
24	Liquid Soap		500	Set
25	Slippers		20	Set
26	Cylinder		5	Set
27	Brown Tap		100	Set
28	Formaldehyde	35 Ltr	200	Set
29	Spray Bottle		10	Set
30	Apron		20	Set
31	Wall Clock		5	Set
32	Name Plate		5	Set
33	Wiper		5	Set
34	Dustbin	Different Sizes	10	Set
35	Duster		15	Set
36	Cutting Paper	Lump Sum	1	Set



37	Mop		20	Set
38	Funnel		1	Set
39	CCTV Camera	Complete set with monitor	16	Set
40	Plug tray		5,000	No.
41	Misc. Items	As required	1	Set

<b>7</b>	<b>Glassware, Metalware, Bottles, Lids and Labware</b>			
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S. No	Item	Description	Qty	Unit
1	Test tube	glassware	200	Set
2	Test tube stand	glassware	50	Set
3	Petri dish	glassware	70	Set
4	Beaker 100 ml	glassware	6	Set
5	Conical flask 100 ml	glassware	6	Set
6	Beaker 250 ml	glassware	6	Set
7	Conical Flask 250 ml	glassware	6	Set
8	Measuring cylinder 10 ml	glassware	6	Set
9	Beaker 500 ml	glassware	3	Set
10	Pipettes 1 ml	glassware	3	Set
11	Pipettes 10 ml	glassware	3	Set
12	Pipettes 2 ml	glassware	3	Set
13	Pipettes 5 ml	glassware	3	Set
14	Pipette Stand	glassware	1	Set
15	Glass Bottles with Lids		80,000	Set
16	Multipurpose Utility Trays	Plastic, Perforated Trays	50	No.
17	Multipurpose Utility Trays	Plastic Trays	50	No.
18	Laboratory Spatula, 6" S S	Stainless Steel, 6" Spatula, Pack of 6	6	Sets
19	Long forcep	Size 12", stainless steel, pack of 6	6	Sets
20	Scalpel Holder	Stainless Steel	20	No.
21	Spirit Lamp	Stainless Steel	12	No.
22	Scissor	Stainless Steel, 6 "	12	No.
23	Scalpel blades	Stainless Steel, No. 11, Pack of 30	2	Set
24	Beaker Tongs	Stainless Steel with plastic grip	3	No.
25	Micro pipettes	1-10 micro ltr, 20-200 micro ltr, 100-1000 micro ltr, 1-5 ml	4	No. Each
26	Misc. Items	As required	1	Set

<b>8</b>	<b>Hardening Chamber</b>			
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S.No	Item	Description	Qty	Unit
1	Primary Hardening Chamber	Supply and Installation of Hi-Tech Poly House 1500 Sqm., as per technical specification.	1	Set
2	Secondary Hardening Chamber	Supply and Installation of Shade Net House 4000 Sqm. Flat Roof, as per technical specification.	1	Set

<b>9</b>	<b>Protocols, Mother Culture &amp; Packaging Material</b>			
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S.No	Item	Description	Qty	Unit
1	Protocols	Detailed protocol for 5 crops shall be provided.	5	Set
2	Mother Culture	3000 Mother of Banana, Strawberry, Bamboo & Pineapple	3000	Nos
3	Packaging Material	Corrugated Cardboard 5 Ply Strong box & Thermocol Box.	1,200	Nos
4	Certification and accreditation to the tissue culture Lab		As required	-