

ANNEXURE A:

TECHNICAL SPECIFICATIONS FOR EQUIPMENTS REQUIRED FOR CELL CULTURE FACILITY

S.no	Equipment	Specification
1	Inverted microscope with camera (01)	<ol style="list-style-type: none">1. Camera port having minimum ≥ 3 watt LED Illumination or more2. Should have 10x eyepiece with FN 22 or better.3. Objectives: Long working distance objective 4x, 10x, 20x (option, above 20X)4. It should have Achromat objectives.5. Should have Antifungal treated optics.6. The Microscope must have intensity regulator to adjust light intensity and should be suitable for bright field and phase contrast.7. It should have long working distance condenser 67-75mm or better.8. Camera: Digital scientific camera system of CMOS/ CCD. Preferably suitable for Fluorescence imaging also and should have high % QE.9. High Resolution, ≥ 8 megapixel or above, Image sensor for CMOS: 6 mm x 4 mm or better / or CCD: 2/3".10. Should have 25-30 frame per second live display t 1k resolution.11. Should have 12-14-bit depth of each RGB, pixel size 2.4 micrometer x 2.4 micrometer or more.12. Live cell imaging, image preview, display, save the data on computer platform /hard disk. (No Memory card slot-based camera).13. Live USB 3.0 PC Interface for PC connectivity (No Memory card slot).14. Camera should be capable to capture BF, PH, Fluorescence images.15. Licensed imaging software for measurement, live display, video recording, annotation, fluorescence/ channel merging, intensity profile, etc.16. Data Processing Unit: Branded PC with i7 processor, 8-16 GB RAM or above, 1 TB or above SSD, 18-22" HD Screen, Windows 11 Professional <p style="text-align: center;"><u>Accessories</u></p>

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		<p><u>Laptop (01)</u></p> <ol style="list-style-type: none"> 1. Intel i5 processor (or better) 2. 8-16 GB RAM or higher. 3. 512 GB or greater solid state hard drive (SSD). 4. A wireless network adapter that supports 802.11n or higher. 5. 64-bit versions of Microsoft Windows 11 (to be supported by imaging software) 6. Charger and all other relevant accessories must be included. 7. It is recommended an accidental damage warranty is available.
2	<p>Laminar flow cabinet (01)</p>	<ol style="list-style-type: none"> 1. The basic equipment shall consist of a HEPA filter, pre filter, suitable blower assembly, necessary lighting, indicators and controls for the cabinet. 2. Type of Flow: Vertical-Re-circulatory. 3. HEPA FILTER: Face dimensions: 4ft (L) X 2ft (W) X 6 ft The HEPA filter should have rated efficiency of 99.97% (or better) at 0.3 microns to provide product protection of Class 100 or exceeding Class 100 requirements of Federal Standards 209E or equivalent ISO within the work. 4. Pre filter with Synthetic, non-woven polyester fibers having casing of enamel painted CRCA frame with Retention of 10 - 15 Micron and 90 % Efficiency. Washable with an arrestance of 90% or better 5. Dimensions: 32”(w) x30” (D)x33” (H) 6. Specifications - With Airborne particulate controller and UV microprocessor controller - Should qualify ISO 5 vertical laminar flow air standards. 7. Must have 360-degree visibility-Integral polypropylene base for easy cleaning with thermoplastic construction - Built-in fluorescent light and Slip hatch access port - HEPA filter monitor automatically indicates when filter change is required - Sturdy cart for mobility - Metal-free polypropylene construction available - Ultra Low Particulate Air filter IV bar, HEPA filter monitoring with audible/visible filter change alarms - Variable speed blower control and Lab event timer - One-touch feature control - Switches and indicators: Individual switches and indicator lamps for blower motor, florescent lamp and UV lamp. - Low noise level - Should be suitable for Media plate pouring, Non-hazardous cell culture and Sterile compounding 8. System Configuration Accessories, spares and consumables. - System as specified - Spare HEPA Filters and PRE Filters, 2 Germicidal UV lamp - Other fitting required for attaching auxiliary services are 1. Electrical outlet socket (5 ampere rating)

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		9. Standards: Should be CE or FDA or BIS approved product 10. Electrical connection: 230V, AC, 15 Amp 11. Separate lighted power ON/OFF indicator switches for blower and lighting.
3	CO₂ Incubator (01)	1. Microprocessor controlled 170 Ltr direct heat stackable CO ₂ Incubator temperature control from 4°C above ambient to 50°C, with control accuracy ±0.1°C. with high Tem. Decontamination at 120. 2. It should have six-sided direct heating with fanless, gentle convection circulation to provide stable temperature control, excellent uniformity and rapid recovery with no over shoot. 3. It should have CO ₂ control range from 0.2 to 20% with control accuracy and uniformity of ±0.1% and should have rapid recovery of at least 0.7% per minutes. 4. It should have Infra-red (IR) CO ₂ sensor It should come with minimum 4 adjustable height shelves & humidity reservoir (removable) to achieve at least 95% RH. 5. It should have independent door heater eliminate condensation on inner door surface. 6. It should have HEPA filter on CO ₂ inlet, it should have 25mm access port. 7. It should be ISO 9001 & CE Certification
4	High Speed Centrifuge with various rotor sizes (01)	1. Robust metal housing; compact design with chemical-resistant (coated) housing. 2. Easy-to-clean, smooth rotor chamber that is resistant to acids, alkalines, disinfectants used in the laboratory. 3. Standard rotor with a capacity of at least 18 positions; aerosol-tight (chemical-resistant coated); exchangeable. 4. Should have 1.5/2.0ml x 18 places and 0.2ml/0.5ml/ x 18 rotors, Fixed Angle 1.5/2.0mlx18, Fixed Angle 1.5/2.0mlx24, PSR Rotor 0.2ml 5. Maintenance-free motor. - Maximal relative centrifuge force: 15,000 G. - Automatic lid lock, starting with and during run of rotor. 6. Option: Automatic opening at the end of the run. - Emergency unlock for electricity blackout. 7. LCD display; protected; showing time and relative centrifugal force or speed in ref or rpm. 8. Speed adjustable in 100 rpm steps. 9. If a keypad is used, it should be foil protected. 10. Timer for runs between 30 seconds and 30 minutes and an option for continuous operation for longer runs. 11. Short time operation by pressing a time button for short spin. 12. Adjustment of running time in steps of 30 seconds. 13. Short acceleration time to maximum rcf in ≤20 seconds.

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		14. Short breaking time from maximum rcf in ≤ 20 seconds. 15. Noise level: ≤ 58 dbA. 16. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
6.	Deep Freezer (-86°C) (01)	1. Upright Model: CFC free high efficiency double refrigeration system for cooling and freezing filled in the bottom. 2. Temperature: 0°C-86°C + - 0.5°C (to work in -70 to -86°C range). 3. Temperature Control: Digital temperature controller (including display at suitable eye level), Microprocessor Control/Microcontroller-for temperature setting, Alarms for-Voltage, over heat, over cool as well as for under temperature, power fail, Door ajar conditions 4. Size: 300 liters or more (up to 450 L) with minimum 4 Stainless-Steel, rust-free shelves. Fixed in casters for easy maneuverability. Polystyrene Insulated inner doors for the compartments. Pre-coated metal body to prevent environmental damage 5. Electricity: 230 volts AC, 50Hz single phase. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards. 6. Refrigeration system: Heavy-duty maintenance free refrigeration system with hermetically sealed refrigeration compressors and reliable cascaded refrigeration to minimize noise and vibration. 7. Air-cooled with security lock to prevent unintentional switch off. Short cooling time of 4 to 5 hours at 40°C ambient temperature. The equipment should be of continuous duty and frost- free. 8. Convenient Air Filter Grill allows easy access for cleaning and changing. Access port for CO ₂ back up. It shall be fitted with 24x7 temperature recorders / data loggers which allows for a minimum of 3 GB data storage and the data must be downloadable via a USB port. 9. Deep freezer shall not have an automated defrosting system without a manual override. 10. Audiovisual Electronic Alarm System independent of power supply and Remote alarm contact in case of equipment failure/ power failure 11. Electrically heated doors for quick opening of frozen doors. Accessories to include suitable boxes and racks for storage of specimen deposits/ DNA extracts/culture isolates in cryo-vials (16 in No. of suitable dimension for 2 ml cryo-vials). 12. Cyro- gloves (4 sets wrist length 12") to be provided as part of accessories

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7.	Refrigerator (300L or more) (01)	<ol style="list-style-type: none"> 1. Vertical, capacity 300 lts or more (up to 450L), frost free, CFC free, single door. House hold refrigerator. 2. Equipment quoted should comply with Indian Standards Institutions 3. Guidelines or any other National or International Guidelines. 4. Supply voltage: 230 ± 10 V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. 5. The line cord/Power cord supplied with the equipment shall be of acceptable durability, length, and c current carrying capacity complying with Indian Standards. 6. Voltage regulator of appropriate rating to be included to cope with 160-260 V.
8.	Water Bath (01)	<ol style="list-style-type: none"> 1. Stainless Steel, insulated double walled. 2. Inner wall of stainless steel. 3. Thermostatic temp. control from ambient to 85 - 90° C ($\Delta 0.50$) complete with immersion heater 4. Aluminium /SS cover, 5. Brass drain cock, 220-240 volts AC, 50Hz. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards. 6. Dimensions outside: (approx.)36x41x25 cms; inside: - (approx.)27x30x15 cms; Capacity not given because the dimensions specified are required for the proper functioning of the water bath in the Laboratory for optimum utilization of the space. 7. Power: (approx.) 480W; 8. Digital microprocessor displays to set temperature point preventing thermal runaway. 9. Seamless reservoir with no welds to leak or rust, see- through cover is hinged and removable, and steeply gabled to accept taller samples.
9	Autoclave (01)	<ol style="list-style-type: none"> 1. Chamber volume should be 90-100 liters. 2. It should operate with saturated steam under pressure of 15 to 22 PSI (adjustable). 3. It should have sturdy double wall construction with boiler made of stainless steel at least 16 gauge sheet. 4. Should provide heat resistant SILICON door gasket withstand up to 140 Deg. C. 5. Outer shell should also be made of stainless steel. 6. Stand shall be made of Mild steel with anticorrosion paint. 7. Boiler and outer shell should be provided with air insulation. 8. Lid should be made of steel sheet and tightened by radial locking. 9. Joint-less gaskets should be made of Neoprene rubber.

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		<ul style="list-style-type: none"> 10. Sterilizer should be fitted with water level arrangement to indicate water position inside the boiler. 11. Pressure gauge, air/steam release cock and two safety valves should be provided. 12. It should have immersion type heating element 13. It should be supplied with cord and plug to work on 220 Volts 50 cycles A.C. supply. 14. Safety features of sterilizers: Door locking facility, Low water protection system, Pressure cut off facility and all other necessary safety features. 15. The sterilizer should be fitted with suitable PLC (Microprocessor) for fully automatic cycle operation instead of manual operating valve with digital displays of Chamber Pressure, temperature etc. 16. The unit should be manufactured as per IS specifications Mark ISI:3829 and also should bear the certification. 17. The sterilizer should have minimum 2 years warranty with service facility at Hamdard University, New Delhi.