



OFFICE OF THE COMPTROLLER
SRI KARAN NARENDRA AGRICULTURE UNIVERSITY
JOBNER-303 329 Distt. Jaipur (Rajasthan)
e-mail Id : comptroller@sknau.ac.in
Phone No : 01425-254988

Dr. D. R. Shivran
Comptroller

No.F ()SKNAU/ Comp/Tender/Equip. & Inst./2017-18/3357

Dated: 04.11.2017

AMENDMENTS/CLARIFICATIONS

Subject : Amendments in Bid documents and Technical and other specifications regarding purchase of goods viz. equipments , instruments of BIN No. F () SKNAU/ Comp/Tender/Equip. & Inst./2017-18/2946 dated 12.10.2017

In reference to above cited subject, representations received from the firms and issues raised by the bidders in pre bid meeting held on 27.10.2017 are examined by the competent authorities and technical committee. The following clarification/corrigendum/amendments are issued for inclusion in bid document and technical specifications of the equipments, instruments :-

S. No.	Item name	Ref. specification & page No.	Current Specifications in the Tender	Amendments made in Specifications	Remarks
1.	GC-MS Quantity= 01	Short description: pp. 45 to 47	Microprocessor based GC based system on Microsoft windows operating system with high sensitivity, MS Detector with workstation, software capillary columns and essential accessories for operative at 220-250 V under Indian conditions. System should be designed and manufactured under ISO 9001 and should comply with most of the international regulatory, safety and electro-magnetic	Microprocessor based GC based system on Microsoft windows operating system with high sensitivity, MS Detector with workstation, software capillary columns and essential accessories for operative at 220-250 V under Indian conditions. System should be designed and manufactured under ISO 9001 and should comply with most of the international regulatory, safety and electro-magnetic compatibility requirement.	No Change

			compatibility requirement.		
		Capacity	12-14 L with HS System capable of supporting 2-3 injectors and 3-4 detector ports simultaneously. Capable to lock the retention time of analysis, result comparable and transfer method with minimum method modification.	12-14 L with Auto Sampler and Head Space System capable of supporting 2-3 injectors and 3-4 detector ports simultaneously. Capable to lock the retention time of analysis/ Retention Time Alignment , result comparable and transfer method with minimum method modification.	For accurate and precise measurement
		Detector	Quadrupole (triple mass Spectrometer).	Triple Quadrupole Mass Spectrometer Mode (MS) •It should have Full scan, Selected Ion Monitoring (SIM), combined full scan/SIM Modes (MS/MS) •It should have Multiple/Selected Reaction Monitoring (MRM/SRM), combined SRM/full scan, product ion scan and Neutral loss modes Ion Source •It should have EI source. Programmable to 350 °C or more •It should have Integrated, dual filament for EI with improved filament lifetime Transfer Line Temperature •The temperature should be up to 350 °C or more Quadrupole Mass Analyzer • Mass Range: 10 –1000u or better • Heated, off-axis ion guide for noise	Several techniques are available in quadrupole detectors and it was felt important in prebid meeting to specify it as per our requirements

				<p>reduction and solid, homogeneous, non-coated and cleanable Quadrupole rods or suitable technology</p> <ul style="list-style-type: none"> •Resolution: Automatic tuning down to 0.4u or better <p>Detection System</p> <ul style="list-style-type: none"> •The detection system should be with off-axis dynode, discrete dynode electron multiplier and electrometer, linear range of >10e7 <p>Electron Energy</p> <ul style="list-style-type: none"> •It should have an adjustable electron energy from 0eV to 150eV or more <p>Emission Current</p> <ul style="list-style-type: none"> •It should have emission current up to 300 μA or more <p>Scan Speed</p> <ul style="list-style-type: none"> •The MS should have scan speed up to 20000 u/sec or better •300 SRM transitions/sec or better •1ms dwell time for SRM/MRM transition or better <p>Vacuum System</p> <ul style="list-style-type: none"> •It should have a High capacity (>250 L/s), dual-stage turbomolecular pump or better •It should have Standard rotary-vane pump <p>Sensitivity Specifications</p> <p>Electron Ionization SRM/MRM</p> <ul style="list-style-type: none"> •1 μL of 100 fg/μL octafluoronaphthalene (OFN) will produce the following minimum signal- 	
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				<p>to-noise for the transition from m/z 272 to m/z 222: 6,000:1 or better</p> <p>Electron Ionization Full Scan •1 µL of 1 pg/µL OFN will produce the following minimum signal-to-noise for m/z 272 when scanning from 50–300 u: 1,500:1 or better</p> <p>Instrument Detection Limit •4 fg or less OFN derived at the 99% confidence level from area precision of eight sequential injections of 1 µL, 10 fg/µL OFN, acquired in EI SRM/MRM</p>	
		Electronic Pneumatics Control	EPC channels for inlets, detectors, or auxiliary gases. Pressure should be adjusted by increments of 0.001 psi. The system should have an inbuilt atmospheric pressure sensor to compensate for altitude and ambient temperature variation. The system should have retention time locking facility.	EPC channels for inlets, detectors, or auxiliary gases. Pressure should be adjusted by increments of 0.001 psi. The system should have an inbuilt atmospheric pressure sensor to compensate for altitude and ambient temperature variation. The system should have retention time locking facility.	No change
		Column Oven	A large Volume GC oven to provide easy access to two columns with a temperature range 4 °C above ambient to 450°C with a temperature set point resolution of 1°C. Retention time repeatability <0.009% and area repeatability <1.2% RSD. Maximum ramp rate 120°C/min.	A large Volume GC oven to provide easy access to two columns with a temperature range 4 °C above ambient to 450°C with a temperature set point resolution of 1°C. Retention time repeatability <0.0009 min and area repeatability <1.2% RSD. Maximum ramp rate 150°C/min.	modified for better accuracy
		Temperature range:	(ambient+4 ⁰ C) to 450 ⁰ C in steps of 1 ⁰ C.	deleted	already mentioned

		Temp. Accuracy:	0.01 ⁰ C step calibration.	0.01 ⁰ C step calibration	
		Cooling speed:	450 ⁰ C to 50 ⁰ C in 6-7 mins.	450 ⁰ C to 50 ⁰ C in 5 mins	To make range narrow
		Temp. programming:	Minimum 20 steps including cooling step.	Minimum 20 steps including cooling step	
		Injection port:	Split/split less injection port-2 (one for normal liquid injection and the other for large volume injection). Adjustable pressure set points with increments of 0.001 psi up to 100 psi. Maximum temperature attainable should be 400 ⁰ C. Suitable for all capillary columns (50, 100, 250, 320 microns and above). Split ratios up to 7,500 : 1.	One Split/split less injection port and one PTV Injector. Adjustable pressure set points with increments of 0.001 psi up to 140 psi . Maximum temperature attainable should be 400 ⁰ C. Suitable for all capillary columns (50 µm to 530 µm i.d.). Split ratios up to 7,500 : 1.	It is important to mentioned the pressure range
		Direct Injection mode:	Pressure control mode, programming steps, rate setting.	Pressure control mode, programming steps, rate setting.	
		Display:	LCD Window with user friendly setting and monitoring.	LCD Window with user friendly setting and monitoring.	
		Auto Liquid Sampler & Head Space Sampler Specifications			Heading added
		Sample capacity:	The head space sampler must hold at 50-100 vials in a tray.	The Auto and head space sampler must hold at 50-100 vials in a tray.	To more accuracy and precision
		Sample Oven:	The HS must have a 12 position oven for optimized sample overlapping constant time heating.	The HS must have minimum 6 position oven for optimized sample overlapping constant time heating	To reduce the cost of instrument
		Sample Vials:	The HS must allow use of standard crimp top or screw cap vials of 10- 20 ml.	The HS must allow use of standard crimp top or screw cap vials of 10- 20 ml.	
		Sample Shaking:	The HS must allow a sample shaking parameter with choice of off, low, or high.	The HS must allow a sample shaking parameter with choice of off, low, or high	

		Multiple Headspace Extraction:	The HS shall permit multiple headspace extraction (MHE) modes with up to 100 extractions per vial for method development and validation or for analysis of sample in unusual matrices.	The HS shall permit multiple headspace extraction (MHE) modes with up to 100 extractions per vial for method development and validation or for analysis of sample in unusual matrices.	
		Multiple Headspace Extraction Concentration:	The HS must provide multiple headspace extraction concentration (MHC) mode, with up to 10 extractions from 1 vial made followed by one GC start after the last extraction to increase sensitivity.	The HS must provide multiple headspace extraction concentration (MHC) mode, with up to 10 extractions from 1 vial made followed by one GC start after the last extraction to increase sensitivity.	
		Capillary columns:	At least one non polar column (5% phenyl 95% dimethyl polysiloxane), one mid polar column (6% cyanopropyl-phenyl 94% dimethyl polysiloxane) and one polar column (100% polyethylene glycol) and one general purpose column.	At least one non polar column (5% phenyl 95% dimethyl polysiloxane), one mid polar column (6% cyanopropyl-phenyl 94% dimethyl polysiloxane) and one polar column (100% polyethylene glycol) and one general purpose column. Columns for Fatty Acid Profiling (100mtr)	To make instrument more applicable
				FID Detector : Capillary column optimized compatible with 1/8" and 1/16" packed column <ul style="list-style-type: none"> • Flameout detection and automatic re-ignition • Minimum Detectable Level (MDL): <1.8 pg C/s • Sensitivity: >0.03 Coulombs/gC • Linear dynamic range: >107 (10%) • Maximum temperature: 450 °C in steps of 0.1 °C 	To make instrument more applicable
				NIST Library Latest Version with lifetime free licence	It is an important

					component of the instrument
		UPS:	Single phase uninterrupted power supply (UPS) pack of appropriate KVA with minimum of 60 min back up, LCD display, on-line setup; 220 -250 V, Maintenance free battery, RS-232 interface.	Single phase uninterrupted power supply (UPS) pack of 10 KVA with minimum of 60 min back up, LCD display, on-line setup; 220 - 250 V, Maintenance free battery, RS-232 interface.	To specify the capacity of UPS
		Other Requirements:	All essential tubing's, nuts, ferrules, tubings, software CD with upgrades.	All essential tubing's, nuts, ferrules, tubings, software CD with upgrade.	
		Local Accessories:	Branded PC (HP/Dell/etc) with latest configuration (P4), LaserJet Printer (HP 3310), Gas purification panel along with N2, H2, Zero air Cylinder along with their regulator.	Branded PC (HP/Dell/etc) with latest configuration, purification panel along with N2, H2, Zero air Cylinder along with their regulator.	
		Optional Accessory:	Auto sampler for liquid samples.	deleted	Already mentioned
		Cryogenic work attachment:	-50 ⁰ C to 450 ⁰ C.	-50 ⁰ C to 450 ⁰ C.	
		Gas generation system	(for N2, Air, H2 or HE)	Supply with cylinders for N2, Air, H2 or HE	Gas generation system generation is not available
		Consumables :		Consumables <ul style="list-style-type: none"> • Autosample syringe 5ul Qty 3 • Autosample syringe 10ul Qty 3 • Screw Top 2ml size autosampler vial Qty 1000 • Graphite/Vespel ferrule for 0.25ID Column Qty 10 • Graphite/Vespel ferrule for 0.32ID Column Qty 10 	To make instruments operative just after installation. It is expected that the company will provide genuine

				<ul style="list-style-type: none"> • Injector Septa - Qty 200 • Capillary Column nut for S/SL Injector – Qty 5 • Capillary Column nut for Programmable Injector – Qty 5 • Liner for S/SL Injector – Qty 5 • Liner for Programmable Injector – Qty 1 • Liner Sealing Ring for Programmable Injector – Qty 10 • Liner Sealing Ring Viton for S/SL Injector – Qty 10 • Vacuum Pump Oil 1ltrs – Qty 2 • Dual Filament – Qty 4 • Mass Tuning/Calibration Solution – Qty 1 	chemicals
		Warranty	Minimum Two years warranty period. Three years CMC (Comprehensive Maintenance Contract) at nominal value (maximum 2.0 % of total cost) after the expiry of warranty period.	Minimum two years warranty period. Two years AMC (Annual Maintenance Contract) at nominal value (maximum 2.0 % of total cost) after the expiry of warranty period.	
		General Terms and Conditions:	<ol style="list-style-type: none"> 1) The vendor must have supplied at least 3 similar systems for a similar application. For this detail of the institute, scientist name, his/her contact number and a satisfactory certificate from them is required. 2) The qualified vendor is required to demonstrate complete features of the system as per the offer. 3) The Bidder shall prepare a similar table to justify compliance clearly with the requirements 	<ol style="list-style-type: none"> 1) The vendor must have supplied at least 3 similar systems for a similar application. For this detail of the institute, scientist name, his/her contact number and a satisfactory certificate from them is required. 2) The qualified vendor is required to demonstrate complete features of the system as per the offer. 	

			4) Vendor must provide at least one week training to concerned scientist at their R&D or at the place where the similar equipment is running successfully. On-site demonstration and training is also must.	3) The Bidder shall prepare a similar table to justify compliance clearly with the requirements 4) Vendor must provide at least one week training to concerned scientist at their R&D or at the place where the similar equipment is running successfully. On-site demonstration and training is also must.	
2.	Infra Red Gas Analyzer Quantity= 01	Description: pp. 47 to 48	The instrument should be differential non-dispersive Infra Red Gas Analyzer with microprocessor control of linearization for both CO ₂ and H ₂ O.	The instrument should be differential non-dispersive Infra Red Gas Analyzer with microprocessor control.	It is self explanatory
		Uses:	Able to measure photosynthesis, transpiration, internal CO ₂ concentration, stomatal conductance, leaf temperature, PAR and chlorophyll fluorescence etc. Instrument should be portable and compatible for measurement in both open and closed system.	Able to measure photosynthesis, transpiration, internal CO ₂ concentration, stomatal conductance, leaf temperature, PAR and chlorophyll fluorescence etc. Instrument should be portable and compatible for measurement in both open and closed system.	
		CO₂ range:	0-3000 ppm.	0-3000 ppm. Accuracy : ±5ppm upto 1500ppm	For precise and accurate measurement
		H₂O range:	0-75 m mol mol ⁻¹	0-75 m mol mol ⁻¹ Accuracy : ±1.0mmolmol⁻¹	
		PAR sensor measuring range:	0-2500 μ mol m ⁻² s ⁻¹ and accuracy: ±5 μ mol m ⁻² s ⁻¹	0-2500 μ mol m ⁻² s ⁻¹ and accuracy: ±5 μ mol m ⁻² s ⁻¹	

		Sensor response time:	Max 30 sec.	Max 30 sec.	
		Pressure:	upto 100 kpa or more.	upto 100 kpa or more.	
		CO₂ and H₂O control:	adjustable upto 100%	CO₂ Control: 2000ppm, H₂O control up to 100% of RH, Light Control: 2500μmol m⁻²s⁻¹ Temperature Control: \pm6 deg C from ambient	For precise and accurate measurement
		Supprting features:	Optional beep sound for stable and accurate readings Interchangeable leaf cuvettes. LCD graphical display. Higher data storage capacity (atleast 4 MB), USB port for data transfer.	Optional beep sound for stable and accurate readings Interchangeable leaf cuvettes. LCD graphical display. Higher data storage capacity (atleast 4 MB), USB port for data transfer.	
		Power supply:	At least 7 VDC battery in-built for 5 hours of continuous use in the field, extended hours of use with additional batteries. Therefore, additional batteries supplied with the system should also be mentioned. Rechargeable batteries with the charger.	At least 7 VDC battery in-built for 5 hours of continuous use in the field, extended hours of use with additional batteries. Therefore, additional batteries supplied (minimum 4 Nos.) with the system should also be mentioned. Rechargeable batteries with the charger.	To use the instrument for longer period
		Operating temperature range:	0-50 ⁰ C, with automatic temperature control. The instrument should also be used to measure chlorophyll fluorescence. Therefore, essential accessories should be supplied for this purpose. Supply complete instruments with carrying case and all essential accessories such as rechargeable battery, RS-232	0-50 ⁰ C, with automatic temperature control. The instrument should also be used to measure chlorophyll fluorescence. Therefore, essential accessories should be supplied for this purpose. Supply complete instruments with carrying case and all essential accessories such as rechargeable battery, RS-232	

			serial cable, communications software for computer etc. Must supply with training manual, catalog, ISO certificate of manufacturer.	serial cable, communications software for computer etc. Must supply with training manual, catalog, ISO certificate of manufacturer.	
		Warranty:	Minimum two years warranty period. The amount for recurring yearly AMC for a period of three years after the expiry of warranty period must be specified.	Minimum two years warranty period. The amount for recurring yearly AMC for a period of three years after the expiry of warranty period must be specified.	
3.	Deep freezer (Vertical): -80 degree C Quantity= 01	Type: pp. 48 to 49	Upright	Upright	
		Capacity :	Minimum 450 Liters	Minimum 450 Liters	
		Operating temperature:	upto -80°C	upto -80°C	
		Description:	<ul style="list-style-type: none"> • Programmable instrument with micro processor-controlled operation system with safety door lock. • VIP (vacuum insulation panels) to provide insulation at lower wall thickness • Protected by German design patent. • Stainless steel interior and, scratch and rust resistant exterior finish. • Automatic closing of the front door below a door opening angle of 90 degree. • Power indicator light with digital temperature indicator (0.1 digit display). • Controlled fan cooling system and 	<ul style="list-style-type: none"> • Programmable instrument with micro processor-controlled operation system with safety door lock. • VIP (vacuum insulation panels) to provide insulation at lower wall thickness • Protected by German design patent. • Stainless steel interior and, scratch and rust resistant exterior finish. • Automatic closing of the front door below a door opening angle of 90 degree. • Power indicator light with digital temperature indicator (0.1 digit display). • Controlled fan cooling system and 	

			<p>even temperature distribution across the entire refrigeration chamber.</p> <ul style="list-style-type: none"> • Automatic switch off when front door opened. • Audible and visible alarms for temperature, power failure or battery low. System must have self-contained alarm system with integrated battery which takes over the alarm function and temperature value measurements in case of power failure for at least 2 full days (48 hours). • The fridge should have on-board monitoring software. • System must have ISO safety requirements. • Interior free from ignition sources. • Key-operated power switch (Power On/Off) with 2 keys. • Facility to keep alarm history on the operation and control panel which stores all the relevant values during a temperature alarm, such as: min, max and average temperature and also the duration of the alarm. • Able to control via self-diagnostic system. • Remote transmission alarm signal in case of power failure. • Should have 3 compartments, 2 separate internal doors to minimize cold loss. • Should have 15 steel racks each for 	<p>even temperature distribution across the entire refrigeration chamber.</p> <ul style="list-style-type: none"> • Automatic switch off when front door opened. • Audible and visible alarms for temperature, power failure or battery low. System must have self-contained alarm system with integrated battery which takes over the alarm function and temperature value measurements in case of power failure for at least 2 full days (48 hours). • The fridge should have on-board monitoring software. • System must have ISO safety requirements. • Interior free from ignition sources. • Key-operated power switch (Power On/Off) with 2 keys. • Facility to keep alarm history on the operation and control panel which stores all the relevant values during a temperature alarm, such as: min, max and average temperature and also the duration of the alarm. • Able to control via self-diagnostic system. • Remote transmission alarm signal in case of power failure. • Should have 3 compartments, 2 separate internal doors to minimize cold loss. • Should have 15 steel racks each for 	
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			<p>boxes of 50mm height and 75 mm height.</p> <ul style="list-style-type: none"> • System should be supplied with a good stabilizer and online UPS with justifiable capacity. 	<p>boxes of 50mm height and 75 mm height.</p> <ul style="list-style-type: none"> • System should be supplied with a good stabilizer and online UPS with justifiable capacity. 	
		Warranty:	System should have 2 years warranty.	System should have 2 years warranty. Must have CE (European/US) certificate and electronic safety	
4.	ELISA Reader and Automatic ELISA Plate Washer Quantity= 01	Description pp. 49	<ul style="list-style-type: none"> • Able to read 96 wells or 380 well plates. The reader should be capable of measuring absorbance, should have cuvette port also. • Light source : 6V, 10W halogen Tungsten lamp • Wavelength range: 190-1000 nm monochromater • Reading Range : 0.0000 – 4.5000Abs. • Resolution: not be less than 0.0001A. • Linearity: between $\pm 0.5\%$, or < 0.025A. • Storage capacity: upto 100000. • Attachments: 4 USB , 1 RS232 , 1VGA port. • Power supply : 12V DC/ 220-250 volts • Temperature range: 5-40 degree C. • Humidity : 10% - 90%. • Shaking facility: orbital and linear. 	deleted	

			<ul style="list-style-type: none"> • Shapes of wash plate: flat-bottom, round bottom, U-bottom or V-bottom. • Wash head channels: 8-12 channels. • Wash cycles: 1-99 cycles. • Wash line: 1 to 12 lines selectable. • Residual volume: 0.1- 0.5 µl/hole. • Dispensing volume: 100-100 µl/hole, able to extend further. • Wash mode: Plates and strips • Lotion type: Minimum 3 types, extendable upto 5 types. • Imbibitions time: 0.1 to 9.9 seconds. • Certification: Must be ISO certified 		
		Warranty:	System should have 2 years warranty.		
5.	Incubator Shaker Quantity= 01	pp. 49 to 50	<ul style="list-style-type: none"> • Powerful triple eccentric drive mechanism. • PID microprocessor controller. • User-friendly sealed control panel. • Large, easy-to-read LCD display. • Electronic timer from 1 minute to minimum 72 hours with non-volatile memory function. • Temperature Range: ambient to 60°C with accuracy of $\pm 0.1^{\circ}\text{C}$. • Temperature Uniformity: $\pm 1^{\circ}\text{C}$. • Shaking Speed: 30- 600 rpm with a uniformity of $\pm 1\text{rpm}$. • Capacity: 50mlx4, 100mlx4, 	<ul style="list-style-type: none"> • Powerful triple eccentric drive mechanism. • PID microprocessor controller. • User-friendly sealed control panel. • Large, easy-to-read LCD display. • Electronic timer from 1 minute to minimum 72 hours with non-volatile memory function. • Temperature Range: ambient to 60°C with accuracy of $\pm 0.1^{\circ}\text{C}$. • Temperature Uniformity: $\pm 1^{\circ}\text{C}$. • Shaking Speed: 30- 600 rpm with a uniformity of $\pm 1\text{rpm}$. • Capacity: 50mlx4, 100mlx4, 	To invite certified companies

			<p>250mlx3, 500mlx3; Maximum capacity should be 1000 mlx5; Platform Size should be 340x370mm.</p> <ul style="list-style-type: none"> • Power supply: 220-230V 50/60Hz. • Certificates: System should be CE, ISO certified. <p>Warranty: System should have 2 years warranty.</p>	<p>250mlx3, 500mlx3; Maximum capacity should be 1000 mlx5; Platform Size should be 340x370mm.</p> <ul style="list-style-type: none"> • Power supply: 220-230V 50/60Hz. • Certificates: System should be CE, ISO certified. <p>Warranty: System should have 2 years warranty.</p> <p>Must have CE (European/US) certificate and electronic safety</p>	
6.	High Speed Refrigerated Centrifuge Quantity= 01	pp. 50	<ul style="list-style-type: none"> • System should have microprocessor based large LCD display that provides all visual information. • Temperature range: -9 to 40⁰ C. • Speed: 100-20000 rpm, Increment: 10rpm • Speed Accuracy: ±20rpm • RCF: 1000- 30,000 x g, Increment: 10xg, • Rotors: 2 ml, 7ml, 15 ml, and 50 ml rotors. They should be bio-containment, safe and autoclavable • Run Time: 1 min ~ 99 min ~ HOLD (Continuous Operation) • Ttemperature Range: -16 C ~ 40°C. • Safety Devices Door Interlock, Over Speed Detector. System 	<ul style="list-style-type: none"> • System should have microprocessor based large LCD display that provides all visual information. • Temperature range: -9 to 40⁰ C. • Speed: 100-15000 rpm, Increment: 10 rpm • Speed Accuracy: ±20rpm • RCF: 1000- 20,000 x g, Increment: 10xg, • Rotors: 2 ml, 10 ml and 15 ml rotors. They should be bio-containment, safe and autoclavable • Run Time: 1 min ~ 99 min ~ HOLD (Continuous Operation) • Safety Devices Door Interlock, Over Speed Detector. System should have over-Temperature Detector, Automatic Internal 	<p>To clarify the instrument in a better way.</p> <p>Rotors: Specified the capacity as per the rotors available with companies and to reduce the cost of instrument</p>

			<p>should have over-Temperature Detector, Automatic Internal Diagnosis</p> <ul style="list-style-type: none"> • Attachments: whisper quiet operation, suit for lab environment; brushless motor drive, maintenance free; powerless compressor and cooling system, fast cooling;a good stabilizer and online UPS. • Certificate: System should be CE, ISO certified. <p>Warranty: System should have 2 years warranty.</p>	<p>Diagnosis</p> <ul style="list-style-type: none"> • Attachments: whisper quiet operation, suit for lab environment; brushless motor drive, maintenance free; powerless compressor and cooling system, fast cooling;a good stabilizer and online UPS. • Certificate: System should be CE, ISO certified. <p>Warranty: System should have 2 years warranty.</p> <p>Must have CE (European/US) certificate and electronic safety</p>	
7.	Gel Documentati on System Quantity= 01	pp. 50 to 51	<ul style="list-style-type: none"> • Pixel Resolution 752 x 582. 	Image resolution > 4 megapixel	Gel doc quality monitor by image resolution
			<ul style="list-style-type: none"> • Pixel Size (um VXH) 8.3 x 8.3. 	Pixel Size 4.6 x 4.6 um	Important for wider applications
			<ul style="list-style-type: none"> • Camera fully enclosed in darkroom, free form dust and shake. 	Camera fully enclosed in/out darkroom, free form dust and shake.	To use it both the environments
			<ul style="list-style-type: none"> • Fully automatic Control through software with PC. • Protecting from UV irradiation with the design of auto shutoff UV lights when open the door. 	<ul style="list-style-type: none"> • Fully automatic Control through software with PC. • Protecting from UV irradiation with the design of auto shutoff UV lights when open the door. 	To enhance the applications as per the latest technology. It is required

			<ul style="list-style-type: none"> • Build-in overhead white light, durable LED reflection • Slide out tray hold UV trans-illuminator and trans-white converter plates • Standard UV trans-illuminator wavelength 312nm. • Epi-UV optional (254/312/365nm) • Easy to change filter, as it positioned at the top of the darkroom • LCD screen to make easier object position and focus (only for model GX750SC) • Powerful software have the function of capture, edit, analysis and database • Camera CCD camera • Lens Type 6× motorized zoom Darkroom • full function control panel for zoom ,focus ,Iris and illuminator • display panel Build-in LCD screen • UV Transilluminator Transmitted area:21cm x 26cm wave length:312nm • Trans-white Uniform white transillumination converter plate • Epi-UV epi-UV illumination source(option) 	<ul style="list-style-type: none"> • Build-in overhead white light, durable LED reflection • System should hold with UV transilluminator, white light conversion screen, • Standard UV trans-illuminator wavelength 302/312 nm with standard transmitted area . • Epi-UV optional (254/312/365nm) • Easy to change filter, as it positioned at the top of the darkroom • LCD screen to make easier object position and focus (only for model GX750SC) • System should have single software for image acquisition and 1D analysis with unlimited licence registration. • Camera: 12 bit or better CCD camera • Lens type 6× motorized zoom Darkroom • full function control panel for zoom, focus, Iris and illuminator • display panel Build-in LCD screen • Warranty: System should have 2 years warranty. Must have CE (European/US) certificate and electronic safety 	<p>for validation and publications in reputed Journals</p>
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			<ul style="list-style-type: none"> Epi-white durable LED reflection software Gel Imaging System has the function of database ,image capture, image edit and image analyze <p>Warranty: System should have 2 years warranty.</p>		
8.	<p>PCR Machine (Gradient) Quantity= 01</p>	pp. 51	<ul style="list-style-type: none"> 96x0.2ml well thermal cycler with alloy well block and gradient facility With o-ring hermetic seal Ramping rate of 3-5°C Temperature range of 0-100 °C Gradient range of up to 24 °C Temperature accuracy of ±0.2°C Memory of up to 1000 programs Password protected safety Auto restart option in event of power failure Warranty of atleast 1 year Input power 400-500W Suitable On-Line UPS system With ambient room temperature controllingsystem for Suitable On-Line UPS system With ambient room temperature controlling system for smooth functioning of the equipment Warranty: System should have 2 years warranty. 	<ul style="list-style-type: none"> 96x0.2ml well thermal cycler with alloy well/gold/silver/reduced mass block and gradient facility With o-ring hermetic seal Ramping rate of 4-5°C Temperature range of 0-100 °C Gradient range of 20-100 °C Temperature accuracy of ±0.2°C Memory of up to 1000 programs Password protected safety Auto restart option in event of power failure Warranty of atleast 1 year Input power 400-500W Suitable On-Line 2 KVA UPS system with 2 hour backup at ambient room temperature Warranty: System should have 2 years warranty. <p>Must have CE (European/US) certificate and electronic safety</p>	It is important to mention the technical details like gradient range and accuracy. The capacity of UPS with power backup is important.

9.	Ice Flakes Maker Quantity= 01	pp. 51	<ul style="list-style-type: none"> • Capacity 50 kg/ 24 h, • Ice Storage- 15 kg, • Water Cons. 51.5, • Unit Dim (mm) 380 x 540 x 722, • Input power (W), 280, 	<ul style="list-style-type: none"> • Capacity 50 kg/ 24 h, • Ice Storage- 15 kg, • Water Cons. 51.5, • Input power (W), 280 under Indian conditions. 	
		Warranty:	Minimum two years.	Warranty: Minimum two years. Must have CE (European/US) certificate and electronic safety	To invite certified companies
10.	Chlorophyll Meter Quantity= 01	Description: pp. 51 to 52	A lightweight Handheld meter for measuring the chlorophyll content of leaves without causing damage to plants. Measurement area : 2-3mm x 3-4mm Measurement method : Optical Density difference at 2 wavelengths Light source : 2 LED elements Receptor : 1 SPD (silicon photodiode) Display : LCD panel showing 4 digits Display Range : 0 to 200 SPAD units Memory Function : Memory capacity for up to 30 values Power : 2 AA- Size Alkaline batteries.	A lightweight Handheld meter for measuring the chlorophyll content of leaves without causing damage to plants. Measurement area : 2-3mm x 3-4mm Measurement method : Optical Density difference at 2 wavelengths Light source : 2 LED elements Receptor : 1 SPD (silicon photodiode) Display : LCD panel showing 4 digits Display Range : 0 to 200 SPAD units Memory Function : Memory capacity for up to 30 values Power : 2 AA- Size Alkaline batteries.	
		Warranty:	Minimum one year warranty period.	Minimum one year warranty period. Must have CE (European/US) certificate and electronic safety	To invite certified companies
11.	Micro Centrifuge Quantity= 01	pp. 52	Maximum capacity: 24 x 2ml. Speed: 0- 25,000 rpm with minimum 16,000 RCF. Display: LCD and microprocessor controlled. Preset time: 0- 90 min, short run and continuous run must be possible	Maximum capacity: 24 x 2ml. Speed: 0- 15,000 rpm with minimum 20,000 RCF. Display: LCD and microprocessor controlled. Preset time: 0- 90 min, short run and continuous run must be possible	To allow fair competition among firms and to get equipment with wider applications.

			<p>Additional items: maintenance-free brushless induction drive motor, atleast 2 curves and motorized lid lock with emergency opening of lid. Permissible temperature increase during operation: 0- 10°C after 20-25 min. continuous run. Voltage stabilizer. Size: 24 x 1.5/2ml, 18 x 0.25/0.4 ml fixed angle autoclavable rotors.- Adapters: adapter for reaction vials 0.25-0.4 ml, for PCR tubes 0.2 ml and for reaction vials 0.5-0.7 ml Power supply: 220 -250 V under Indian conditions. Certificate: ISO certified Warranty: Minimum one year warranty period.</p>	<p>Additional items: maintenance-free brushless induction drive motor, atleast 2 curves and motorized lid lock with emergency opening of lid. Permissible temperature increase during operation: 0- 10°C after 20-25 min. continuous run. Voltage stabilizer. Size: 24 x 1.5/2ml, 18 x 0.25/0.4 ml fixed angle autoclavable rotors.- Adapters: adapter for reaction vials 0.25-0.4 ml, for PCR tubes 0.2 ml and for reaction vials 0.5-0.7 ml Power supply: 220 -250 V under Indian conditions. Certificate: ISO certified Warranty: Minimum one year period. Must have CE (European/US) certificate and electronic safety</p>	
12.	<p>Seed Moisture meter Quantity= 01</p>	pp. 52	<p>Applicable for cereals, pulses, vegetables seeds etc Body – SS or mild steel Range: 1 to 30% Approx. Consistency: - ± 0.05 % Display- LCD displays with back lights, 3-4 digits Existence of Low battery indication Compatibility with computer and able to gate print out with printer Auto calibration and option to check the calibration frequently Programmable for different crops (1-5) Recall facility for last 4-10 data Facility to record data and date log- in</p>	<p>Applicable for cereals, pulses, vegetables seeds etc Body – SS or mild steel Range: 1 to 30% Approx. Consistency: - ± 0.05 % Display- LCD displays with back lights, 3-4 digits Existence of Low battery indication Compatibility with computer and able to gate print out with printer Auto calibration and option to check the calibration frequently Programmable for different crops (1-5) Recall facility for last 4-10 data Facility to record data and date log- in</p>	

			facility Power- 220-250 V as per Indian standard Suitable temperature for operation – 10-40°C	facility Power- 220-250 V as per Indian standard Suitable temperature for operation – 10-40°C	
		Warranty:	Minimum one year warranty period.	Minimum one year warranty period. Must have CE (European/US) certificate and electronic safety	To invite certified companies.
13.	Spectrophotometer Quantity= 01	pp. 53	<ul style="list-style-type: none"> • Single Beam UV-Vis Spectrophotometer usable for measurement of absorbance, transmission & K Factor in the range of 200-1000 nm. • Accessibility to use quartz and glass cuvettes. • Large screen with graphic display. • Highly stable and accurate • Facility to get data printed out by printer able to get display on computer • Optical system- Single Beam, Grating approximately 1000-1200lines/mm • Wavelength Range - 200-900 nm • Wavelength Accuracy - ± 0.5 nm • Lamps - Deuterium & Tungsten halogen lamp • Detector - Silicon photodiode • Power Requirement - As per Indian standards 		
		Warranty:	Minimum one year warranty period.	Minimum one year warranty period. Must have CE (European/US) certificate and	To invite certified

				electronic safety	companies
14.	Vertical Laminar Air Flow Quantity= 01	pp. 53	<ul style="list-style-type: none"> • ISO Certified defined with minimum 2 year warranty. • LED Display along with HEPA Filters. • Programmed with alarms to warn of HEPA Filter when it is blocked. • Fluorescent lamp /UV Lamp for illumination and disinfection purposes. • Air velocity: 0.3-0.6m/s • Operative at 220V in Indian conditions. • Noise level: Maximum 62 DB (A). • Body: stainless steel. • Port: 5 amps. • LPG inlet. • Working area: Size 4 x 2 feet. 	<ul style="list-style-type: none"> • ISO Certified defined with minimum 2 year warranty. • LED Display along with HEPA Filters. • Programmed with alarms to warn of HEPA Filter when it is blocked. • Fluorescent lamp /UV Lamp for illumination and disinfection purposes. • Air velocity: 0.3-0.6m/s • Operative at 220V in Indian conditions. • Noise level: Maximum 62 DB (A). • Body: stainless steel. • Port: 5 amps. • LPG inlet. • Working area: Size 4 x 2 feet. 	
		Warranty:	Minimum one year warranty period.	Minimum two years warranty period.	
15.	Microkjehldahl digestion & distillation unit Quantity= 01	pp. 53	<p>Construction:304 Grades Stainless Steel, Flasks 30 ML, 50 ML & 100ML 250 ML, Heating Element:Kanthal A-1 Heater Watt:200 Watt Max. Temp.:350°C Lead Fume Duck Power Supply:220 Volts, No. of flask-06</p>		
		Warranty:	Minimum one year warranty period.	Minimum two years warranty	To invite

				period. Must have CE (European/US) certificate and electronic safety	certified companies
16.	Deep Freezer -20°C (Vertical) Quantity= 01	pp. 53 to 54	<ul style="list-style-type: none"> • Volume 400 liter • Temperature range Temp. upto - 20°C • Cabinet type upright • Micro purpose controlled LCD display of parameter with features touch key • CFC free refrigerant • Manual defrost mode • Direct cooling system • Noise level: 65db • Shelf -5 • Power coated galvanized steel liner. • Multiple malfunction alarm including high /low temperature alarm sensor error alarm door alarm power failure alarm remote alarm. • Safety lock prevent unauthorized access • Two type of Alarm indicator. • Company should be have ISO 9001, CE, GMP and IVD confirmatory /USFDA certificate. • Supply with Suitable Voltage Stabilizer 		
		Warranty:	Minimum one year warranty period.		

17.	Hot Air Oven Quantity= 01	pp. 54	<ul style="list-style-type: none"> • System should be microprocessor controlled/programmable. • The ovens also incorporate an electronic timer that has a range of 1 minute to 99 hours timer function. • Timer and temperature parameters are displayed in large LED for fast and easy readout. • Capacity approx 140 L. • Temperature Range: ambient +5 to 200°C. • Temperature set accuracy: $\pm 0.5^{\circ}\text{C}$. • Temperature uniformity: $\pm 1^{\circ}\text{C}$. • Chamber size: 420 x 400 x 650 mm. • System should be ISO certified. 	<ul style="list-style-type: none"> • System should be microprocessor controlled/programmable. • The ovens also incorporate an electronic timer that has a range of 1 minute to 99 hours timer function. • Timer and temperature parameters are displayed in large LED for fast and easy readout. • Capacity approx 140 L. • Temperature Range: ambient +5 to 200°C. • Temperature set accuracy: $\pm 0.5^{\circ}\text{C}$. • Temperature uniformity: $\pm 1^{\circ}\text{C}$. • Chamber size: 420 x 400 x 650 mm. • System should be ISO certified. 	
		Warranty:	Minimum one year warranty period.	Minimum one year warranty period.	
18.	Liquid Nitrogen Container Quantity= 01	pp. 54	<ul style="list-style-type: none"> • System should have capacity of 40-50 liters. • Weight should be between 10-20 Kg • Static evaporation rate: 0.118 liters/day • Static holding times : 282 days • Should have straw capacity 720 (0.5ml) for single level and 1440 (0.5ml) for double level. • Should have at least 6 numbers of canisters. 	<ul style="list-style-type: none"> • System should have capacity of 40-50 liters. • Weight should be between 10-20 Kg • Static evaporation rate: 0.118 liters/day • Static holding times : 282 days • Should have straw capacity 720 (0.5ml) for single level and 1440 (0.5ml) for double level. • Should have at least 6 numbers of canisters. 	

			<ul style="list-style-type: none"> • Provided with suitable carrier. 	<ul style="list-style-type: none"> • Provided with suitable carrier. 	
		Warranty:	Minimum one year warranty period.	Minimum one year warranty period.	
19.	CO₂ INCUBATOR Quantity= 01	pp. 54 to 55	<ul style="list-style-type: none"> • Temperature Control : Digital PID Controller • Temperature Range: Ambient +5°C to 50°C, +/-0.1°C at 37°C • CO Range : 20 to 20%, +/-0.1% at 5% • CO Sensor: 2 Dual-Beam Non dispersive Infra-red sensor • Humidification Up to 96% RH at 37°C • Display: Dual Display, Set - LCD & Run- LED • Dimension in : 510 x 480 x 705 • Dimension Out: 605 x 610 x 990 • Capacity: Above 150 litres. • Material in : Stainless Steel • Material Out : Steel plate with powder coating • Water Jacket Volume : Aprox 30-35 litres • Door Double, Silicon magnetic packing door • Inner door Safety glass door with U-groove packing • Shelves 3EA, Stainless Steel plate, adjustment type • Safety Device: Over Temp. protector, Gas monitor alarm, 	Deleted	IRGA is more advanced which is already mentioned

			Water level monitor, Power breaker		
		Warranty:	Minimum one year warranty period.		
20.	Water Bath Quantity= 01	pp. 55	<ul style="list-style-type: none"> • Stable temperature range from +30° to +100°C, with constant mixing for even temperature distribution in the working volume and increased heat transfer. • Applicable for scientific research and plant science laboratories. • Stainless steel body with the capacity of approximately 8L. Dimension: about 250-300 x 350-400 x 200-250 mm. • Operative at 220-250V under Indian conditions • LED display. • ISO certified 	<ul style="list-style-type: none"> • Stable temperature range from +30° to +100°C, with constant mixing for even temperature distribution in the working volume and increased heat transfer. • Applicable for scientific research and plant science laboratories. • Stainless steel body with the capacity of approximately 8L. Dimension: about 250-300 x 350-400 x 200-250 mm. • Operative at 220-250V under Indian conditions • LED display. • ISO certified 	
		Warranty:	<ul style="list-style-type: none"> • Minimum one year warranty period. 	Minimum Two years warranty period. Must have CE (European/US) certificate and electronic safety	To invite certified companies
21.	Cilika tab plus-tablet based microscope Quantity= 01	pp. 55	<ul style="list-style-type: none"> • With lenses-4x, 10x, 40x, 100x. • Lithium ion battery with 15 hr back up. • Operating system Android, • Illumination LED with intensity regulation • Option for computer attachment 	Deleted	
		Warranty:	Minimum one year warranty period.		

22.	Kjeldahl Nitrogen analysis system Quantity= 01	pp. 55 to 56	<ul style="list-style-type: none"> • Fully Auto Kjeldahl Distillation unit • Suitable for all type of sample like solid & liquid Soils, plants, water, Pesticides, fertilizers, pharmaceuticals etc. • Microprocessor Based atleast six samples Macro tube • Touch screen LCD Display System and manual Compatible with AOAC, EPA, DIN approved • Inbuilt auto shutdown & auto start up Facility. • Temperature range: Ambient - 450 °C. • Precision: $\pm 0.5 -1.0$ °C • Programmable memories: 50-100 users • Microprocessor based, compatible with PC having RS 232 options. provision for PC Compatible. LCD Display scrubbing system. • ISO certified. 	<ul style="list-style-type: none"> • Fully Auto Kjeldahl Distillation unit • Suitable for all type of sample like solid & liquid Soils, plants, water, Pesticides, fertilizers, pharmaceuticals with all essential accessories. • Microprocessor Based at least six samples Macro tube • Touch screen LCD Display System and manual Compatible with AOAC, EPA, DIN approved • Inbuilt auto shutdown & auto start up Facility. • Facility for fumigation control. • Temperature range: Ambient - 450 °C. • Precision: $\pm 0.5 -1.0$ °C • Programmable memories: 50-100 users • Microprocessor based, compatible with PC having RS 232 options. provision for PC Compatible. LCD Display scrubbing system. Four stage acid neutralization scrubber with FRP Tank & submergible pump & magnetic pump for water recirculation & suction. 	To get an environment friendly instrument Distillation System and scrubber system specification s are needed for better performance of instrument.
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				<ul style="list-style-type: none"> • Stages - Condensation, Neutralization in Alkali, Neutralization in water, Dissolution of air free of acid fumes in raw tank water <p><u>Automatic Distillation System</u></p> <ul style="list-style-type: none"> • Autosequencing Programmable Microprocessor based Distillation with inbuilt software, Colour Touch Screen TFT LCD Display. • Auto Intelligent run of programmable steps includes Addition of Boric Acid, Dilution; KMNO4 Alkali includes Steam Processing, Residue Removal, and Process over indication with alarm with inbuilt delay time features, Automatic Titration Connectivity feature for future up gradation, Aspiration of Receiver Residue. • Automatic calculation of results on input of titre value from digital burette in terms of percentage of Protein/N2, Available N2/Total N2/etc. • Inbuilt Automatic micro Printer for instant print out of results without connecting to PC. • Electrical Requirement - 220 - 230V/50Hz.Equipment should be ISO Certified.. 	
		Warranty:	Minimum two years warranty period.	<ul style="list-style-type: none"> • Minimum two years warranty period. Must have CE (European/US) 	To invite certified companies

				certificate and electronic safety ISO certified.	
23.	Soxhlet oil Extraction system Quantity= 01	pp. 56	<p>Sample capacity:- 6-8 samples Compatible auto sequence solvent extraction System with timer Microprocessor based, having RS 232 option, PC friendly with touch screen LCD Display system Inbuilt fume hood and other options for safety and environment safe operation. Attach with touch screen LCD display. Programmable protocol for 50-100 programmers Accuracy: 0.5- 1.0 % Inbuilt option for automatic shutdown & Auto start up facility. Microprocessor based with option of PC via RS232, LCD display. ISO certified</p> <p>Warranty- atleast two years warranty period.</p>	<p>Sample capacity:- 6 samples. Microprocessor based, having RS 232 option, PC friendly with touch screen LCD Display system with all essential accessories.</p> <p>Inbuilt fume hood and other options for safety are deleted</p> <p>Minimum two years warranty period. Must have CE (European/US) certificate and electronic safety</p>	To invite certified companies
24.	Crude Fibre analysis System Quantity= 01	pp. 56	<p>Fully automatic for fibre extraction Sample size 6-8 with capacity of fibre extraction about from 0.25-10 g. Microprocessor based for auto</p>	<p>Fully automatic for fibre extraction Sample size 6 with capacity of fibre extraction about from 0.25-10 g. Microprocessor based for auto</p>	Six samples is sufficient.

			<p>reagent addition (acid /caustic). Fitted with timer. LCD display Inbuilt auto shutdown & auto start Inbuilt facility to control Cooling water with suction hood or other option. Accuracy :0.5 – 1.0 % Attachments : vaccum pressure, reverse air stream & reagent addition Back pressure RS 232 Interface along with PC/ Laptop Connectivity Body stainless steel with durable suction pump</p>	<p>reagent addition (acid /caustic). Fitted with timer. LCD display with all essential accessories. Inbuilt auto shutdown & auto start Inbuilt facility to control Cooling water with suction hood or other option. Accuracy : 0.5 – 1.0 % Attachments : vacuums pressure, reverse air stream & reagent addition Back pressure RS 232 Interface along with PC/ Laptop Connectivity Body stainless steel with durable suction pump</p>	
			Warranty: Minimum one year warranty period.	Minimum two years warranty period. Must have CE (European/US) certificate and electronic safety	To invite certified companies
	Average annual turnover of the last three years (2014-15, 2015-16 and 2016-17)	-	₹ 200.00 lacs	₹ 50.00 lacs for equipments, instruments having estimated cost less than ₹ 10.00 lacs ₹ 100.00 lacs for equipments, instruments having estimated cost more than ₹ 10.00 lacs.	-
	Estimated cost and bid security of GC-MS, respectively	-	₹ 40.00 lacs and ₹ 0.80 lacs, respectively	₹ 60.00 lacs and ₹ 1.20 lacs, respectively	-

Note :

1. The university may ask for demo for quoted model before finalizing the tender.
2. Installations of quoted model should have been made by company in recognized research institutes/ university in Rajasthan/India.
3. Please note that all the above amendments/clarifications in technical specifications/bid documents are the integral part of bid document.
4. All other terms and conditions remains the same.



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