TENDER DOCUMENT

FOR

PROCUREMENT OF

SCIENTIFIC EQUIPMENT

FOR

JIWAJI UNIVERSITY, GWALIOR

REGISTRAR

JIWAJI UNIVERSITY

GWALIOR - 474011 (M.P.)

जीवाजी विश्वविद्यालय, ग्वालियर

S. No./Store/2022/926 **Date: 27.12.2022**

// द्वितीय ऑनलाइन ई-निविदा आमंत्रण //

जीवाजी विश्वविद्यालय, ग्वालियर के लिए केवल निर्माण/अधिकृत विक्रेता से www.mptenders.gov.in पर ऑनलाइन निविदा आमंत्रित की जाती है जो कि www.mptenders.gov.in से डाउनलोड की जा सकती है, इसके अतिरिक्त विश्वविद्यालय की वेबसाइट www.jiwaji.edu पर भी देखी जा सकती है। विवरण निम्नानुसार है।

निविदा प्रपत्र समस्त टर्म्स एण्ड कंडीशन्स एवं विवरण सहित www.mptenders.gov.in वेबसाइट पर नीचे दी गई राशि ऑनलाइन टेण्डर फीस जमा करने पर डाउनलोड की जा सकती है।

S. No	Tender ID MP/JUG/ Tender NO.	Description of work	Qty.	Estimates Cost of work	EMD	Cost of Tender (Non refundable)
1.	2022_JIWAJ_240384	HPCC System	01	1,50,00,000	4,50,000	12,500
2.	2022_JIWAJ_240385	Scanning Electron Microscope-EDAX	01	1,00,00,000	3,00,000	12,500
3.	2022_JIWAJ_240387	Physical Parameter Measurement System	01	2,20,00,000	6,60,000	15,000
4.	2022_JIWAJ_240389	Behaviour and Activity Test System	01	85,00,000	2,55,000	10,000
5.	2022_JIWAJ_240392	Single Crystal X-ray Diffractometer	01	2,20,00,000	6,60,000	15,000
6.	2022_JIWAJ_240393	Atomic Absorption Spectrophotometer	01	35,00,000	1,05,000	5,000
7.	2022_JIWAJ_240394	Aerosol Mass monitor	01	4,00,000	12,000	2,000
8.	2022_JIWAJ_240395	Automated Nucleic Acid Extraction System	01	25,00,000	75,000	5,000
9.	2022_JIWAJ_240396	CHN Analyser	01	40,00,000	1,20,000	5,000
10.	2022_JIWAJ_240398	Gas Chromatograph Mass Spectrometer (GCMS)	01	70,00,000	2,10,000	10,000
11.	2022_JIWAJ_240399	Gel Doc System	01	12,00,000	36,000	2,000
12.	2022_JIWAJ_240400	Lab Fermenter	01	12,00,000	36,000	2,000
13.	2022_JIWAJ_240401	Real Time PCR	01	20,00,000	60,000	5,000
14.	2022_JIWAJ_240403	Total Organic Carbon(TOC) Analyzer	01	9,00,000	27,000	2,000
15.	2022_JIWAJ_240404	Automatic Kjeldahl Nitrogen Analyzer	01	15,00,000	45,000	2,000
16.	2022_JIWAJ_240405	Bio-Safety Cabinet	01	8,00,000	24,000	2,000

1. ऑनलाइन निविदा प्रपत्र क्रय करने की अंतिम **दिनांक 18.01.2023 सांय 5:00 बजे** तक है।
2. ऑनलाइन बिड डालने का **दिनांक 18.01.2023 सांय 5:00 बजे** तक है।
3. ऑनलाइन टेक्नीकल दस्तावेज डाउनलोड **दिनांक 20.01.2023 प्रातः 11:00 बजे** किये जायेंगे।
4. क्रय/तकनीकी समिति की बैठक की सूचना पृथक से निर्धारित की जावेगी।
5. निविदा के शेष समस्त जानकारी उपरोक्त दर्शायी गयी वेबसाइट्स पर देखी जा सकती है।
6. कुलसचिव, जीवाजी विश्वविद्यालय को बिना कोई कारण बताये निविदा स्वीकृत/अस्वीकृत/ रद्दीकरण करने का अधिकार होगा।

कुलसचिव

जीवाजी विश्वविद्यालय, ग्वालियर

Tender No./Store/2022/926 **Date: 27.12.2022**

// द्वितीय ऑनलाइन e-निविदा आमंत्रण //

जीवाजी विश्वविद्यालय, ग्वालियर के लिए केवल निर्माण/अधिकृत विक्रेता से www.mptenders.gov.in पर ऑनलाइन निविदा आमंत्रित की जाती है जो कि www.mptenders.gov.in से डाउनलोड की जा सकती है, इसके अतिरिक्त विश्वविद्यालय की वेबसाइट www.jiwaji.edu पर भी देखी जा सकती है। विवरण निम्नानुसार है।

निविदा प्रपत्र समस्त टर्म्स एण्ड कंडीशन्स एवं विवरण सहित www.mptenders.gov.in वेबसाइट पर नीचे दी गई राशि ऑनलाइन टेण्डर फीस जमा करने पर डाउनलोड की जा सकती है।

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10.	2022_JIWAJ_240398	Gas Chromatograph Mass Spectrometer (GCMS)	01	70,00,000	2,10,000	10,000
11.	2022_JIWAJ_240399	Gel Doc System	01	12,00,000	36,000	2,000
12.	2022_JIWAJ_240400	Lab Fermenter	01	12,00,000	36,000	2,000
13.	2022_JIWAJ_240401	Real Time PCR	01	20,00,000	60,000	5,000
14.	2022_JIWAJ_240403	Total Organic Carbon(TOC) Analyzer	01	9,00,000	27,000	2,000
15.	2022_JIWAJ_240404	Automatic Kjeldahl Nitrogen Analyzer	01	15,00,000	45,000	2,000
16.	2022_JIWAJ_240405	Bio-Safety Cabinet	01	8,00,000	24,000	2,000

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कुलसचिव

NOTICE INVITING TENDER DETAILS

S.No.	Description	
1.	Department name	Jiwaji University Gwalior -474011 (M.P.)
2.	Tender Number	JU/COE /Tender/2022
3.	Tender Subject	Supply, Installation & commissioning of Scientific Equipments.
4.	Period of Contract	One Year
5.	Form of contract	Schedule Wise
6.	Tender type	Open
7.	Tender category	Products (both hardware and software)
8.	EMD/Bid Security (INR) (Enclose in separate cover)	HPCC System 4,50,000 Scanning Electron Microscope-EDAX 3,00,000 Physical Parameter Measurement System 6,60,000 Behaviour and Activity Test System 2,55,000 Single Crystal X-ray Diffractometer 6,60,000 Atomic Absorption Spectrophotometer 1,05,000 Aerosol Mass monitor 12,000 Automated Nucleic Acid Extraction System 75,000 CHN Analyser 1,20,000 Gas Chromatograph Mass Spectrometer (GCMS) 2,10,000 Gel Doc System 36,000 Lab Fermenter 36,000 Real Time PCR 60,000 Total Organic Carbon(TOC) Analyzer 27,000 Automatic Kjeldahl Nitrogen Analyzer 45,000 Bio-Safety Cabinet 24,000 18,00,000
9.	EMD/Bid security Payable to	Registrar ,Jiwaji University, Gwalior -474011 (M.P.) EMD has to be paid online through **www.mptenders.gov.in**
10.	Tender fee (non refundable)	The tender fee to be submitted online through **www.mptenders.gov.in** paid in the favour of Registrar, Jiwaji University, Gwalior.
11.	Downloading of Tender Documents	www.mptenders.gov.in /www.jiwaji.edu
12.	Last date of purchase of online tender	18.01.2023 (5.00 PM)
13.	Bid Submission Closing Date	18.01.2023 (5.00 PM)
14.	Submission of E-Bid	www.mptenders.gov.in For delay, University cannot be held responsible.
15.	Technical	20.01.2023 (11:00 AM)

	Specification Bid Opening Date	
16.	Price Bid Opening	www.mptenders.gov.in
17.	Place of Technical Bid Opening	In the Administration Block of Jiwaji University. Gwalior
18.	Officer Inviting Bids/Contact Person	Registrar, Jiwaji University Gwalior - 474 011, (M.P.)
19.	Eligibility Criterion	As per the tender document (Annexure -02)
20.	Procedure For Bid Submission	e-BID has to be submitted through **www.mptenders.gov.in.** Documents in support of Technical Specifications along with make and models of all the items as per the list mentioned in Annexure -05 duly mentioning the make. Supporting documents of standard certifications. Annexure-02 of tender document duly signed with office seal as a token of acceptance of our standard terms and conditions List of customers, to whom the bidder had supplied identical materials in the past along with P.O. details and performance report. Annexure -08 of bidding document has to be submitted to The Registrar, Jiwaji University Gwalior.Registrar will not hold any risk and Responsibility for non-visibility of the scanned document or the loss in transit.
21.	General Terms and Conditions	As per tender document

TENDER FEES (To be submitted online)

Sr. No.	Description of Work (Equipment names)	Tender Fees (Non refundable)
1.	HPCC System	12,500
2.	Scanning Electron Microscope-EDAX	12,500
3.	Physical Parameter Measurement System	15,000
4.	Behaviour and Activity Test System	10,000
5.	Single Crystal X-ray Diffractometer	15,000
6.	Atomic Absorption Spectrophotometer	5,000
7.	Aerosol Mass monitor	2,000
8.	Automated Nucleic Acid Extraction System	5,000
9.	CHN Analyser	5,000
10.	Gas Chromatograph Mass Spectrometer (GCMS)	10,000
11.	Gel Doc System	2,000
12.	Lab Fermenter	2,000
13.	Real Time PCR	5,000
14.	Total Organic Carbon(TOC) Analyzer	2,000
15.	Automatic Kjeldahl Nitrogen Analyzer	2,000
16.	Bio-Safety Cabinet	2,000

Contents of the Tender Document

Annexure – 01

Schedule of Quantity

Supply, Installation and Commissioning of Scientific Equipments at Respective Laboratories/Central Instrumentation Facility

Sl.No.	Description of Work	Quantity
1	HPCC System	01
2	Scanning Electron Microscope-EDAX	01
3	Physical Parameter Measurement System	01
4	Behaviour and Activity Test System	01
5	Single Crystal X-ray Diffractometer	01
6	Atomic Absorption Spectrophotometer	01
7	Aerosol Mass monitor	01
8	Automated Nucleic Acid Extraction System	01
9	CHN Analyser	01
10	Gas Chromatograph Mass Spectrometer (GCMS)	01
11	Gel Doc System	01
12	Lab Fermenter	01
13	Real Time PCR	01
14	Total Organic Carbon(TOC) Analyzer	01
15	Automatic Kjeldahl Nitrogen Analyzer	01
16	Bio-Safety Cabinet	01

Annexure -02

ELIGIBILITY CRITERIA AND SPECIAL TERMS AND CONDITIONS

A. ELIGIBILITY CRITERIA FOR TENDERERS:

- The Company/ the tenderer should be in existence for the last 5 years
- The Company or tenderer should have at least one Service Centre in India.
- The tenderer should be a Manufacturer or the authorized representative of the manufacture of equipment or other respective products/ items.

B. SPECIAL TERMS AND CONDITIONS :

1. **Delivery Period:** The delivery should be made within 60 days from the date of receipt of purchase order by the tenderer.
2. **Warranty: All items supplied by the tenderer shall be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative.** Comprehensive warranty should explicitly include all spare parts and system consumable parts. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation. **After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected**
3. **Installation:** The installation should be done at the Laboratories Instrumentation Facility (IF) as mentioned in the Annexure – 04 enclosed, at no extra cost.
4. **Response Time:** The response time of the tenderer to attend to any complaint upon receipt of the complaint/information from the user should not be more than 48 hours.
5. Advance payment either direct or through bank will not be accepted in any case. As per rule, full payment will be made after receipt of material, inspection thereof and after satisfactory installation and working of the entire equipment. **In case of imported equipment LC is to be opened as per rules.**
6. This institution is exempted from payment of Central Excise duty in terms of Govt. Notification No. 1097-Central Excise dated 01.03.1997. Necessary copy shall be provided by the University.
7. For imported equipments: The institution is registered with Department of Science and Industrial Research (DSIR) Govt. of India vide Government Notification No. TU/V/RG-CDE(56)/2009, dated 26.11.2009 is exempted from payment of custom duty.
8. Necessary certificate copy shall be provided by the University. The bidder shall be responsible for getting the consignment cleared and deliver the goods. The expenses on it and concessional duties, if any should be included in the cost of the equipment.
9. The tenderer should avoid the use of vague terms such as **"extra as applicable".** Such tenders will be rejected.
10. Printed conditions on the back of the offer submitted will not be binding unless separately mentioned.

11. Quotations for the accessories to be considered together as one unit and thus total price shall be treated as your bid for the tender. Optional items may be quoted separately. Where the equipment offered is controlled by a preloaded personal computer and it is possible to use an indigenous PC, the same should be quoted instead of an imported PC. The same would apply to a printer or any compiled other accessory or subsystem.

12. Each page of the tender should be signed and stamped by the bidder.

TENDERER
SEAL

Annexure-3

List of Documents to be enclosed

The following documents should be submitted along with the bidding form otherwise the tenders are liable to be disqualified.

1. All the Supporting documents in respect of Eligibility criteria i.e.

Registration /Incorporation Certificate in support of the existence of the company for required number of years as per the tender schedule eligibility criteria.

List mentioning the addresses and contact persons with phone numbers of the service centres present in India.

Supporting Documents indicating that the tenderer is the Manufacture or the OEM/ Authorized representative of the corresponding items/products.

IT returns for the last three Assessment years 2019-2020, 2020-2021, 2021-2022

2. Annexure-02 duly signed & office Seal affixed as a token of acceptance of Special Terms and Conditions.
3. Documents in supports of Technical Specifications for the scientific equipments as mentioned in Annexure-05 clearly mentioning the make and model.
4. The list of customers (minimum of 05 in India) to whom the bidder has supplied same or identical instrument/ material in the past.
5. Annexure-08.

Note:

1. The Registrar Jiwaji University, Gwalior will not hold any risk and responsibility for non-visibility of scanned document or **non receipt of hardcopies** or loss in transit.
2. The Documents that are received in time will only be considered for Technical Bid Evaluation.
3. The tenderer will be disqualified at any stage of the tender process, if found to have mislead or furnished false information in the forms/Statement/Certificate submitted in proof of 1 to 5 above.
4. The Registrar, Jiwaji University, Gwalior does not bind himself to accept the lowest or any tender and he reserve the right to reject any offer without assigning any reason.

Annexure - 04

Address where the equipment to be installed

Respective Laboratories/Central Instrumentation Facility

Jiwaji University

Gwalior -474011 (M.P.)

Annexure - 05

1. Technical Specifications for HPCC System

Supply, installation and commissioning of HPCC for JIWAJI UNIVERSITY with following technical specifications.

1. Log In cum Master Node

Quantity		**1 unit**
Sr. No.	**Specification**	**Description and features to be offered per node**
1.	Processor and Performance Benchmarks	x86 Architecture based processor(s) to be offered Total core count per node–64 or more, with clock speed of at least 2.35 GHz or more base frequency. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher Spec fp rate 2017 benchmark scores as mentioned below must be listed by OEM in spec.org for the same system model or a model from similar series. Spec_fp_2017_rate_base- score must be >=118 Spec_int_2017_rate_base- score must be >=170 High Performance Linpack peak performance score per socket/processor must be >=0.6TeraFlops or more
2.	Security features	Automated BIOS/System level encryption to authenticate input and output data passing thru. System information including, keys, passwords and digital certificates stored/created must be secured from external software attacks and physical theft. Cryptographic functions offered for system security
3.	Memory	RAM: 256GB or more ECC DDR4-3200Mhz or better RAM. At least 16 DIMMs available in total.
4.	Hard Disk Drives & SSDs	2TB or more SAS×4 Numbers SPEED = 7.2K rpm TYPE = SAS 2 x 512GB SATA Enterprise GRADE SSD (1 DWPD)
5.	HDD bays	HDD bays supporting 8 or more SAS/SATA Hard drives and Solid State Drives. At least 2 of them must support NVMe/M.2/U.2 drives (required controller, if any, must be supplied from day one). A secondary storage enclosure is allowed to be offered to meet the requirement.
6.	I/O slots (*Peripheral Component Interconnect Express,**PCIe**)*	2 × PCIe (x16) slots or more
7.	RAID Level support	SAS 12Gbps controller with support for RAID 0, 1, 10, 5 ,50 ,60 & 6 with dedicated cache memory. RAID card must support all HDD bays w/o any additional item to be added. with supported backplane for drive bays and JBOD. System must provide array configuration and management utilities, Independent of port auto-negotiation, optional battery back up unit for future upgrade. Must Support SSP, SMP, STP protocols or more
8.	Graphics controller	Integrated Graphics with on board controller.

9.	Network interface	At least 2 number of Gigabit ports on board.
10.	Ethernet ports	2 × 1 GBPS Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied)
11.	Ports	Minimum 2 USB 3.0 or higher and 1 graphics port
12.	Cluster Interconnect	100 GBPS (or higher) Infiniband Single Port with cable (same make as the IB switch).
13.	Chipset	Applicable / Compatible CHIPSET
14.	Server management (Intelligent Platform Management, Interface, **IPMI**)	- IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. - It should be able to automate mgmt. tasks and automated firmware updates. - Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles - USB based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events
15.	Power supplies	Redundant (N+1) 80 Plus Platinum or better Certified efficient power supplies.
16.	Cooling	Optimum no. of Cooling fans.
17.	Operating System	Should support latest version of 64-bit CentOS.
18.	Warranty	3 years onsite warranty by OEM / Bidder. Physical on-site (JIWAJI UNIVERSITY GWALIOR) visit by technical experts of Bidder or OEM for maintenance and technical support whenever needed.
19.	Software Suites	NAMD, MATLAB,LAMMPS,NWCHEM, GROMACS and more research codes/ software suites to be loaded as part of installation process by bidder.
20.	Form Factor	Rack Mount up to 2U or lesser
21.	All required cables	

2. Compute Node

Quantity	11 units	
Sr. No.	**Specification**	**Description and features to be offered per node**
1.	Processor and Performance Benchmarks	x86 Architecture based processor(s) to be offered Total core count per node– 64 or more, with clock speed of at least 2.35 GHz or more base frequency, Turbo frequency supported 3.2Ghz or more. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher Spec fp rate 2017 benchmark scores as mentioned below must be listed by OEM in spec.org for the same system model or a model from similar series. Spec_fp_2017_rate_base- score must be >=200 Spec_int_2017_rate_base- score must be >=300 High Performance Linpack peak performance score per socket/processor must be >=1.17TeraFlops or more
2.	Security features	Automated BIOS/System level encryption to authenticate input and output data passing thru. System information including, keys, passwords and digital certificates stored/created must be secured from external software attacks and physical theft. Cryptographic functions offered for system security
3.	Memory	RAM: 256GB or more ECC DDR4-3200 Mhz. At least 16 DIMMs available in total.
4.	Hard Disk Drives & SSDs	1 x 512GB SATA Enterprise GRADE SSD (1 DWPD)
5.	HDD bays	HDD bays supporting 8 or more SAS/SATA Hard drives and Solid State Drives. At least 2 of them must support NVMe/M.2/U.2 drives (required controller, if any, must be supplied from day one). A secondary storage enclosure is allowed to be offered to meet the requirement.
6.	I/O slots (*Peripheral Component Interconnect Express,**PCIe**)*	2 × PCIe (x16) slots or more
7.	RAID Level support	SATARAID controller with RAID 0, 1, 10 levels
8.	Graphics controller	Integrated Graphics with on board controller.
9.	Network interface	At least 2 numbers of Gigabit ports on board.
10.	Ethernet ports	2 × 1 GBPS Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied)
11.	Ports	Minimum 2 USB 3.0 or higher and 1 graphics port
12.	Cluster Interconnect	100 GBPS or higher Infiniband Single Port with cable (same make as the IB switch).
13.	Chipset	Applicable / Compatible CHIPSET
14.	Server management (Intelligent Platform Management, Interface, **IPMI**)	- IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. - It should be able to automate mgmt. tasks and automated firmware updates. - Email Alerting methodology, User management functionality with SSL based security , Multi User

		Permission Levels, Multi User Profiles - USB based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events
15.	Power supplies	Redundant (N+1) 80 Plus Platinum or better Certified efficient power supplies.
16.	Cooling	Optimum no. of Cooling fans.
17.	Operating System	Should support latest version of 64-bit CentOS.
18.	Warranty	3 years onsite warranty by OEM / Bidder. Physical on-site (JIWAJI UNIVERSITY GWALIOR) visit by technical experts of Bidder or OEM for maintenance and technical support whenever needed.
19.	Software Suites	NAMD, MATLAB,LAMMPS,NWCHEM, GROMACS and more research codes/ software suites to be loaded as part of installation process by bidder.
20.	Form Factor	Rack Mount up to 2U or lesser
21.	All required cables	
22.	Benchmark- HPL Report must be submitted with bid in the form of a soft copy. Processor used for Benchmark report must be based on the same CPU offered in Compute Nodes. Benchmark must be run on at least 4 and 8 Nodes or more with same memory offered. And report must be submitted with bid.	
23.	All required cables must be supplied	

3. <u>GPU Node</u>

Quantity		**1 unit**
Sr. No.	**Specification**	**Description and features to be offered per node**
1.	Processor and Performance Benchmarks	x86 Architecture based processor(s) to be offered Total core count per node– 64 or more , with clock speed of at least 2.35 GHz or more base frequency, Turbo frequency supported 3.2Ghz or more. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher Spec fp rate 2017 benchmark scores as mentioned below must be listed by OEM in spec.org for the same system model or a model from similar series. Spec_fp_2017_rate_base- score must be >=200 Spec_int_2017_rate_base- score must be >=300 High Performance Linpack peak performance score per socket/processor must be >=1.17TeraFlops or more
2.	Security features	Automated BIOS/System level encryption to authenticate input and output data passing thru. System information including, keys, passwords and digital certificates stored/created must be secured from external software attacks and physical theft. Cryptographic functions offered for system security
3.	Memory	RAM: 256GB or more ECC DDR4-3200Mhz or better RAM. Scalability of system memory must be up to 512GB when fully populated with same capacity DIMMs as offered with the system.
4.	Hard Disk Drives & SSDs	1 x 512GB SATA Enterprise GRADE SSD (1 DWPD)
5.	HDD bays	HDD bays supporting 12 or more SAS/SATA Hard drives and Solid State Drives. At least 2 of them must support NVMe/M.2/U.2 drives (required controller , if any, must be

		supplied from day one). A secondary storage enclosure is allowed to be offered to meet the requirement.
6.	I/O slots (*Peripheral Component Interconnect Express,**PCIe**)*	2 × PCIe (x16) slots or more
7.	GPU/Accelerator	1 x GPU with 32GB or higher memory, 5000+ CUDA Cores, 600+ Tensor Cores, Double Precision Performance of 7TFlops or more. System offered must have support for 2 GPUs for future scalability.
8.	RAID Level support	SATA RAID controller with RAID 0, 1, 10 levels
9.	Graphics controller	Integrated Graphics with onboard controller.
10.	Network interface	At least 2 number of Gigabit ports on board.
11.	Ethernet ports	2 × 1 GBPS Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied)
12.	Ports	Minimum 2 USB 3.0 or higher and 1 graphics port
13.	Cluster Interconnect	100 GBPS or higher Infiniband Single Port with cable (same make as the IB switch).
14.	Chipset	Applicable / Compatible CHIPSET
15.	Server managment (Intelligent Platform Management, Interface, **IPMI**)	- IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. - It should be able to automate mgmt. tasks and automated firmware updates. - Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles - USB based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events
16.	Frameworks Utility / Suite	1.CPU/Accelerator Optimised Tensor Flow 2..CPU/Accelerator Optimised Pytorch 3..CPU/Accelerator Optimised Theano 4..CPU/Accelerator Optimised Caffe 5.CPU/Accelerator Optimised Text2speech 6.CPU/Accelerator Optimised Mxnet 7.CPU/Accelerator Optimised CuDNN 8. Clara Deploy SDK 9.Deep vision AI 10. BIGDFT, 11. Parabricks, 12. R, 13. Microsoft CNTK Frameworks access utility for the above listed frameworks must be provided for unlimited users from day one. Datasheet/manual of the commercially licensed utility to be shared with bid. GPU node should be capable to be used as a standalone and a cluster node both. Certain workloads shall only be used in standalone usage environment.
17.	Power supplies	Redundant (N+N) 80 Plus Platinum or better Certified efficient power supplies.
18.	Cooling	Optimum no. of Cooling fans.
19.	Operating System	Should support latest version of 64-bit CentOS.
20.	Warranty	3 years onsite warranty by OEM / Bidder.

		Physical on-site (JIWAJI UNIVERSITY GWALIOR) visit by technical experts of Bidder or OEM for maintenance and technical support whenever needed.
21.	Software Suites	NAMD, MATLAB,LAMMPS,NWCHEM, GROMACS and more research codes/ software suites to be loaded as part of installation process by bidder.
22.	Form Factor	Rack Mount up to 2U or lesser
23.	All required cables	

4. PFS Storage System Qty -1 Set (Comprising of at least 2 x IO Nodes)

S.No	Description
1.	Parallel File System
	Technical Specification
	Lustre based PFS with following specification :-
	Metadata Storage: more than or equal to 2% of the Usable Storage space offered (using 600GB SAS 10K PM SAS HDDs configured as RAID10 or Similar with one hot-spare.
	Usable Storage(OST) : >= 120TB usable with RAID6 or similar (using up to 4TB, 7.2K RPM SAS HDDs.
	Configured as RAID6 volumes with two Global hot-spare disks. Each individual volume to be ≤ 40TB
	Throughput :> sustained 2GB/s read/write (50:50) performance
	>=120TB (usable in RAID 6 or equivalent configuration) Parallel File System based storage with 1GBps throughput with 1MB block size for the PFS. At least 2 I/O Nodes in fail over configuration to be quoted.
	Each I/O Node to be offered with below listed specifications: Minimum 64 or more cores per node, with clock speed of at least 2.35 GHz or more base frequency. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher
	Redundant Power Supply with at least 80 Plus Platinum efficiency
	64GB DDR4 3200or higher Mhz memory with ECC
	At least 2 no. of PCI-E (x16) expansion slots
	2 x 512GB Data centre grade SSD in RAID1 (for OS)
	With Hi Speed Interconnect ports–minimum 100Gbps
	The PFS solution must be capable of handling the loss of the following without interruption: -One Power Supply -One Fan - One HDD for MDT and Two HDDs for OST - Two I/O Server Nodes The I/O server must have redundant paths to the storage.
Benchmark Report	Benchmark report and Performance demonstration for PFS Throughput . Open-source IOR/IO Zone benchmarks running on compute nodes with 1MB block size. Storage Performance to be measured from compute node using IOR benchmark for 2GBps throughput. Benchmark report must be submitted with bid.

5. Cooling, Rack, UPS and its monitoring/support/services

SL. No.	Items
I.	**Rack:** Vendors should propose optimum solution using at the max two 42U Racks with required PDUs and accessories
II.	**UPS:** Two UPS Units in Failover / Redundant Configuration (1+1). Each UPS of 20 KVA/18 KW should have following features : True online double conversions, IGBT Rectifier & inverter based UPS. Three phases Input/ three phase output with SMF batteries Suitable for 30 Min backup on Full load at 0.9 Load P.f. using 42 Ah X 40 Battery with Each UPS, Input voltage range 340-478V at 100% load, 220-478 V @ 50% load. Input power factor 0.99. Battery Flexible design of 32 to 40 battery. Battery type should be Valve regulated lead-acid (VRLA). Inbuilt Input Isolation Transformer is mandatory required, parallel communication port, RS232, USB, EPO and SNMP interface, BMS interface, Dust Filter at Air Inlet point are required. UPS should be provided with environment monitoring probe to measure temperature and humidity of UPS room. LCD Display indicating all important parameters. UPS software should be compatible to google chrome, Mozilla fire fox and Microsoft internet explorer. Battery open rack, battery interlinks battery breaker, battery to UPS cable as required should be provided with UPS systems. UPS warranty : 3 Year, Battery warranty – at least 2 Years brand Exide / Panasonic or higher brand
III.	Key Board tray, cable manager, cable route, any other required accessories as per requirement of the above mentioned configuration of master and compute node.
IV.	Cooling & Compact Data Centre Solution: Scope of this work involves designing the DC considering N+N redundancy, remote manageability & scalability and setting up the infrastructure for high efficiency containing the following essential elements. Server Rack and Specifications: 2 x Racks based solution. Racks should be a minimum of 47U to enable maximum utilisation of space within in the rack and also provide scope for future expansion. It should be used to mount and house all servers/network/storage devices in the data centre. The rack has to be designed to meet the safety requirements of the modern data centre. Both the front and rear door should be designed to give active high performance closed loop cooling system with handle & unique key lock system, Cable entry should be entered via the roof plate and via the bottom gland plate without affecting the climatic conditions inside the rack. With depth minimum of 1200MM or higher , of each rack. **Each Rack should include: -** 1. 19” Rack frame with sturdy Steel Frame construction with load bearing capacity of 1000Kg. 2. 2 pairs of 47U 19" L Type angles at Front & Rear on 3mm thick punched sections with "U" Marking 3. Front Glass Door with door stiffeners, Rear Sheet Steel Double Door with door stiffeners, Handle with Unique key lock. 4. Set of Side Panels 5. Top & Bottom cover with Fixed & Slide cable gland plate with foam insert

at back side for cable entry.

6. 30A, 1Φ, 250 VAC, Vertical Rack PDU with "C" curve 32A single pole MCB with safety guard, power indicator, 16nos of IEC-320-C13 Sockets, 6nos of IEC-320-C19 Sockets, 2nos of EMO-71-1 6/13Amp Universal Sockets, 6 sq.mm 3 core 3 meter cable with Industrial Plug & Mounting brackets hardware for vertical mount PDU or more as per the solution offered by bidder.
7. Base Plinth of 100mm height
8. Earthing studs to be provided provide
9. Hardware pack of 20 (3 packs / Rack)
10. Blanking Panel 1U(12nos /Rack)
11. Cable Manager
12. All front Doors must be equipped with Automatic Door Opening system and rear doors should have exhaust fans in case of cooling failures.

Air-conditioning Unit with Redundancy - 20kVAbased , with (N+1) redundancy

Closed Loop Cooling Solution: IT-optimised design, providing ideal support for "front-to-back" air routing for the 19" installations. DX Type Close Coupled (in a rack) Air-conditioning system with high CFM & sensible cooling Indoor and Outdoor units. The cold air will be provided in front section of the rack and hot air released by the servers will be sucked back into the aircon from the rear of the rack. Cooling capacity should support an average min density per rack 20kVA & should ensure an energy-efficient dissipation of heat. The external unit should support stepless variation of fan speed based on ambient temperature so as to ensure that the refrigeration system pressures are balanced during all weather conditions. The cooling units are to be mounted in the cooling rack adjacent to the IT rack to ensure that there is no loss of space in the IT Rack.

The System should include :

- Cooling Unit Rack of Size (mm): 400W x 47U H x 1200D with Front & Rear Door & Cable / Pipe entry from either top or bottom cover, 3pt locking system with unique key lock.
- Additionally Base Plinth of 100mm height.
- Cooling Unit Modules with minimum 2nos of EC Fans for maximum efficiency and minimum power consumption in each unit supporting a minimum of 2000CFM.
- Each Cooling Module should have separate control & power module.
- External ODU unit should house the compressor compatible with the Environment Friendly refrigerant.
- Minimum 7'' Touch Screen Display to monitor & control the cooling system.

The cooling system should be with separate indoor units (evaporator) and outdoor units (condenser). The compressor should be part of the outdoor unit to eliminate noise and vibration inside the indoor unit. The Closed Loop Cooling Units should be mounted in a cabinet at the side of the IT racks. The sequence controller should run one cooling unit at a time, and perform a changeover, in case of failure of any of the cooling units. Power connection for outdoor unit: 230V, 1~, 50/Hz.

It should support N+1 redundancy to maintain temperature and humidity profile within ASHRAE TC9.9 or Indian equivalent standard's revised specified limits.

	Rack-mountable Fire Detection and Suppression system Fire detection and suppression system should be equipped with discharge nozzle, cylinder with green UL or equivalent Indian standard listed fire extinguishing agent and piping complete with accessories. The system should include a manual abort option. Fire detection and suppression system must be not occupy any 'U' space in the IT rack. It should have built-in smoke detection with Smoke Sensors mounted at rear of Rack. **Environmental Monitoring System with Alarm** Remote Monitoring system with Graphical user interface with e-mail alerts. The central monitoring system should be rack-mount and should be able to monitor various sensors. The following parameters to be monitored: Temperature, Humidity, Water Leakage, Fire Detection & Extinguishing, Air-conditioning Units and Door access sensor. It should also monitor & control Automatic Door Opening of the Front Door. It should provide a single interface for remote monitoring of all components and generate email alerts and warnings. **Door Access Control System via Biometric Reader** Standalone Biometric Reader cum Controller. One Reader will open all Doors. – The installation, testing and commissioning of Reader, Controller, EM Door lock, cabling, etc. **Ultrasonic Rodent Repeller must also be supplied with the solution**

6. Cluster Management and other S/W Stack

Operating System	CentOS
HPC Operating System Support	REQUIRED
Resource Manager & Scheduler	S/W offered must be a commercial License issued in the name of Jiwaji University
	Job status reporting
	Job History Reporting up to 6 months or more
	Policy-aware workload cum resource manager,
	Policy aware scheduling
	Resource-aware scheduling
	Topology-aware scheduling
	Dynamic reservation of resource
	Advance reservation Live support
	Support of job submission through CLI, Web-services and APIs
	Load aware power management
	Fair share support
	Multiple queues support
	Multiple partitions support
	Dynamic partitions support
	Dynamic queues support
	Scriptless job submission

	Heterogeneous cluster support
	Multi-cluster support
	MPI aware scheduling
	Consumable resources scheduling
	Preemptive and backfill scheduling support
	Application integration support
	Live reconfiguration capability
	SLA/Equivalent
	GPU and Co Processor Aware scheduling
	CPU, Multi Core , Multi thread aware scheduling
	Intuitive web interface to submit and monitor jobs
Resource Management/Job Scheduling Support	REQUIRED
File Systems Supported	Lustre , GPFS FROM DAY ONE
Commercial Licensed Cluster Management S/W (License issued in the name of JIWAJI UNIVERSITY GWALIOR)	Unified system management, monitoring toolset for configuration, diagnosis and management of the system, Cluster manager with provisioning, monitoring and reporting capabilities Support Package and Image based provisioning Support Diskfull and diskless cluster deployment Intuitive web interface to manage and customize the cluster Customizing networks and compute node profiles through GUI Customizing compute nodes (upto changing kernel parameter) Able to Push configuration changes and updates to the compute nodes without reinstalling and rebooting Data Sheet must be submitted with the bid for the product offered. Note : Offered Commercial Licensed Stack must have been deployed by OEM / Bidder earlier as well as part of HPC Solution .
Software Support for both Serial and Parallel Environment	YES

7. Other Items

SL No:	Items
I.	1 Unit of - 17 inch Display, Keyboard, Video and Mouse (KVM) Console with All accessories.
II.	1 Unit of - 16 Port KVM over IP Switch (USB based) with all required Cables & Accessories.
III.	1 Unit of - 24 Port ,1 Gbps (RJ-45) Ethernet Switch for Secondary Communication Purpose and 1 unit of 48 Port,1 Gbps (RJ-45) Ethernet Switch for management.
IV.	36-ports OR MORE based ,100Gbps, 100% Non-blocking, Switching Fabric (

	Infiniband) with embedded Subnet Manager for 36 devices(Nodes) or more and with redundant power supply/supplies. All cables (at least 2m in length or more) required for connecting the devices(Nodes) quoted in this tender should be included/bundled

Supply, Installation and In-house training for HPC :-

- Installation of items part of this tender will have to carried out by the vendor. Any specific requirement of vendor regarding installation of above mentioned items must be mentioned in the technical bid so that JIWAJI UNIVERSITY GWALIOR can provide the resources for the same.
- 1 day **in-house training** by Certified Professionals at JIWAJI UNIVERSITY GWALIOR including installation of software, bench-marking HPL, monitoring of HPC Cluster for 24 Hours, LINUX commands, HPC Management etc. Scripts for the bench-marking calculations will provide on request.

Eligibility Criteria and Other Terms

Mandatory requirements for a bidder to qualify as a participant in this tender:

1. The Server OEM should have executed at least 3 HPC Cluster projects either directly or thru system integrators (at least one cluster of the size 100TF CPU-CPU performance)during last 05 years in India at government organizations or in other countries at reputed organizations using an architecture and technologies similar to this tenderered requirement. The credential of an OEM will also be considered if supply done by their authorized partner. Server OEM must have registered office in India.
2. OEM or Bidder must be listed either in India Top100 Supercomputer list or World Top500 Supercomputer list.
3. Storage OEM must have supplied 2 x PFS solutions (50TB or more) earlier in the past along with HPC Solutions during last 10 years in India using an architecture and technologies similar to this tender in India at government organisations details must be submitted with bid. Credential of an OEM will also be considered if supply done by their authorized partner. Storage OEM must have registered office in India
4. Bidder must not be banned or debarred by any government organization in the past during last 5 years.
5. OEMs can authorize multiple bidders to participate with their products.
6. OEM MAF/authorization for Server Nodes, Storage and Cooling Solution provider must be attached with the bid .
7. All warranty and support must be provided by the bidder.
8. The bidder should have at least one service Center in India with service engineers in the relevant field of quoted item.
9. The bidder should have valid ISO certification. Please attach a copy of the certificate.
10. The bidder must be responsible for complete installation and support the infrastructure.
11. Validity of Quotation: Minimum 3 months.

ANNEXURE-I

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

HPCC System

Quantity: 1 no.

1. Log In cum Master Node

Quantity		1 unit	Compliance Yes/No
Sr. No.	**Specification**	**Description and features to be offered per node**	
1.	Processor and Performance Benchmarks	x86 Architecture based processor(s) to be offered Total core count per node–64 or more, with clock speed of at least 2.35 GHz or more base frequency. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher Spec fp rate 2017 benchmark scores as mentioned below must be listed by OEM in spec.org for the same system model or a model from similar series. Spec_fp_2017_rate_base- score must be >=118 Spec_int_2017_rate_base- score must be >=170 High Performance Linpack peak performance score per socket/processor must be >=0.6TeraFlops or more	
2.	Security features	Automated BIOS/System level encryption to authenticate input and output data passing thru. System information including, keys, passwords and digital certificates stored/created must be secured from external software attacks and physical theft. Cryptographic functions offered for system security	
3.	Memory	RAM: 256GB or more ECC DDR4-3200Mhz or better RAM. At least 16 DIMMs available in total.	
4.	Hard Disk Drives & SSDs	2TB or more SAS×4 Numbers SPEED = 7.2K rpm TYPE = SAS 2 x 512GB SATA Enterprise GRADE SSD (1 DWPD)	
5.	HDD bays	HDD bays supporting 8 or more SAS/SATA Hard drives and Solid State Drives. At least 2 of them must support NVMe/M.2/U.2 drives (required controller, if any, must be supplied from day one). A secondary storage enclosure is allowed to be offered to meet the requirement.	
6.	I/O slots (*Peripheral Component Interconnect Express,**PCIe**)*	2 × PCIe (x16) slots or more	
7.	RAID Level support	SAS 12Gbps controller with support for RAID 0, 1, 10, 5 ,50 ,60 & 6 with dedicated cache memory. RAID card must support all HDD bays w/o any additional item to be added. with supported	

		backplane for drive bays and JBOD. System must provide array configuration and management utilities, Independent of port auto-negotiation, optional battery back up unit for future upgrade. Must Support SSP, SMP, STP protocols or more	
8.	Graphics controller	Integrated Graphics with on board controller.	
9.	Network interface	At least 2 number of Gigabit ports on board.	
10.	Ethernet ports	2 × 1 GBPS Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied)	
11.	Ports	Minimum 2 USB 3.0 or higher and 1 graphics port	
12.	Cluster Interconnect	100 GBPS (or higher) Infiniband Single Port with cable (same make as the IB switch).	
13.	Chipset	Applicable / Compatible CHIPSET	
14.	Server management (Intelligent Platform Management, Interface, **IPMI**)	- IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. - It should be able to automate mgmt. tasks and automated firmware updates. - Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles - USB based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events	-
15.	Power supplies	Redundant (N+1) 80 Plus Platinum or better Certified efficient power supplies.	
16.	Cooling	Optimum no. of Cooling fans.	
17.	Operating System	Should support latest version of 64-bit CentOS.	
18.	Warranty	3 years onsite warranty by OEM / Bidder. Physical on-site (JIWAJI UNIVERSITY GWALIOR) visit by technical experts of Bidder or OEM for maintenance and technical support whenever needed.	
19.	Software Suites	NAMD, MATLAB,LAMMPS,NWCHEM, GROMACS and more research codes/ software suites to be loaded as part of installation process by bidder.	
20.	Form Factor	Rack Mount up to 2U or lesser	
21.	All required cables		

2. Compute Node

Quantity	**11 units**		
Sr. No.	**Specification**	**Description and features to be offered per node**	
1.	Processor and Performance Benchmarks	x86 Architecture based processor(s) to be offered Total core count per node– 64 or more, with clock speed of at least 2.35 GHz or more base frequency, Turbo frequency supported 3.2Ghz or more. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher Spec fp rate 2017 benchmark scores as mentioned below must be listed by OEM in spec.org for the same system model or a model from similar series. Spec_fp_2017_rate_base- score must be >=200 Spec_int_2017_rate_base- score must be >=300 High Performance Linpack peak performance score per socket/processor must be >=1.17TeraFlops or more	
2.	Security features	Automated BIOS/System level encryption to authenticate input and output data passing thru. System information including, keys, passwords and digital certificates stored/created must be secured from external software attacks and physical theft. Cryptographic functions offered for system security	
3.	Memory	RAM: 256GB or more ECC DDR4-3200 Mhz. At least 16 DIMMs available in total.	
4.	Hard Disk Drives & SSDs	1 x 512GB SATA Enterprise GRADE SSD (1 DWPD)	
5.	HDD bays	HDD bays supporting 8 or more SAS/SATA Hard drives and Solid State Drives. At least 2 of them must support NVMe/M.2/U.2 drives (required controller, if any, must be supplied from day one). A secondary storage enclosure is allowed to be offered to meet the requirement.	
6.	I/O slots (*Peripheral Component Interconnect Express,**PCIe**)*	2 × PCIe (x16) slots or more	
7.	RAID Level support	SATARAID controller with RAID 0, 1, 10 levels	
8.	Graphics controller	Integrated Graphics with on board controller.	
9.	Network interface	At least 2 numbers of Gigabit ports on board.	
10.	Ethernet ports	2 × 1 GBPS Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied)	
11.	Ports	Minimum 2 USB 3.0 or higher and 1 graphics port	
12.	Cluster Interconnect	100 GBPS or higher Infiniband Single Port with cable (same make as the IB switch).	
13.	Chipset	Applicable / Compatible CHIPSET	

14.	Server management (Intelligent Platform Management, Interface, **IPMI**)	- IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. - It should be able to automate mgmt. tasks and automated firmware updates. - Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles - USB based drive redirection with support for USB Key, VLAN functionality supports Reading Log Events	-
15.	Power supplies	Redundant (N+1) 80 Plus Platinum or better Certified efficient power supplies.	
16.	Cooling	Optimum no. of Cooling fans.	
17.	Operating System	Should support latest version of 64-bit CentOS.	
18.	Warranty	3 years onsite warranty by OEM / Bidder. Physical on-site (JIWAJI UNIVERSITY GWALIOR) visit by technical experts of Bidder or OEM for maintenance and technical support whenever needed.	
19.	Software Suites	NAMD, MATLAB,LAMMPS,NWCHEM, GROMACS and more research codes/ software suites to be loaded as part of installation process by bidder.	
20.	Form Factor	Rack Mount up to 2U or lesser	
21.	All required cables		
22.	Benchmark- HPL Report must be submitted with bid in the form of a soft copy. Processor used for Benchmark report must be based on the same CPU offered in Compute Nodes. Benchmark must be run on at least 4 and 8 Nodes or more with same memory offered. And report must be submitted with bid.		
23.	All required cables must be supplied		

3. <u>GPU Node</u>

Quantity		**1 unit**	
Sr. No.	**Specification**	**Description and features to be offered per node**	
1.	Processor and Performance Benchmarks	x86 Architecture based processor(s) to be offered Total core count per node– 64 or more, with clock speed of at least 2.35 GHz or more base frequency, Turbo frequency supported 3.2Ghz or more. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher Spec fp rate 2017 benchmark scores as mentioned below must be listed by OEM in spec.org for the same system model or a model from similar series. Spec_fp_2017_rate_base- score must be >=200 Spec_int_2017_rate_base- score must be >=300 High Performance Linpack peak performance score per socket/processor must be >=1.17TeraFlops or more	

2.	Security features	Automated BIOS/System level encryption to authenticate input and output data passing thru. System information including, keys, passwords and digital certificates stored/created must be secured from external software attacks and physical theft. Cryptographic functions offered for system security	
3.	Memory	RAM: 256GB or more ECC DDR4-3200Mhz or better RAM. Scalability of system memory must be up to 512GB when fully populated with same capacity DIMMs as offered with the system.	
4.	Hard Disk Drives & SSDs	1 x 512GB SATA Enterprise GRADE SSD (1 DWPD)	
5.	HDD bays	HDD bays supporting 12 or more SAS/SATA Hard drives and Solid State Drives. At least 2 of them must support NVMe/M.2/U.2 drives (required controller , if any, must be supplied from day one). A secondary storage enclosure is allowed to be offered to meet the requirement.	
6.	I/O slots (*Peripheral Component Interconnect Express, **PCIe**)*	2 × PCIe (x16) slots or more	
7.	GPU/Accelerator	1 x GPU with 32GB or higher memory, 5000+ CUDA Cores, 600+ Tensor Cores, Double Precision Performance of 7TFlops or more. System offered must have support for 2 GPUs for future scalability.	
8.	RAID Level support	SATA RAID controller with RAID 0, 1, 10 levels	
9.	Graphics controller	Integrated Graphics with onboard controller.	
10.	Network interface	At least 2 number of Gigabit ports on board.	
11.	Ethernet ports	2 × 1 GBPS Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied)	
12.	Ports	Minimum 2 USB 3.0 or higher and 1 graphics port	
13.	Cluster Interconnect	100 GBPS or higher Infiniband Single Port with cable (same make as the IB switch).	
14.	Chipset	Applicable / Compatible CHIPSET	
15.	Server managment (Intelligent Platform Management, Interface, **IPMI**)	- IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. - It should be able to automate mgmt. tasks and automated firmware updates. - Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles - USB based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events	
16.	Frameworks Utility / Suite	1.CPU/Accelerator Optimised Tensor Flow 2..CPU/Accelerator Optimised Pytorch 3..CPU/Accelerator Optimised Theano	

		4..CPU/Accelerator Optimised Caffe 5.CPU/Accelerator Optimised Text2speech 6.CPU/Accelerator Optimised Mxnet 7.CPU/Accelerator Optimised CuDNN 8. Clara Deploy SDK 9.Deep vision AI 10. BIGDFT, 11. Parabricks, 12. R, 13. Microsoft CNTK Frameworks access utility for the above listed frameworks must be provided for unlimited users from day one. Datasheet/manual of the commercially licensed utility to be shared with bid. GPU node should be capable to be used as a standalone and a cluster node both. Certain workloads shall only be used in standalone usage environment.	
17.	Power supplies	Redundant (N+N) 80 Plus Platinum or better Certified efficient power supplies.	
18.	Cooling	Optimum no. of Cooling fans.	
19.	Operating System	Should support latest version of 64-bit CentOS.	
20.	Warranty	3 years onsite warranty by OEM / Bidder. Physical on-site (JIWAJI UNIVERSITY GWALIOR) visit by technical experts of Bidder or OEM for maintenance and technical support whenever needed.	
21.	Software Suites	NAMD, MATLAB,LAMMPS,NWCHEM, GROMACS and more research codes/ software suites to be loaded as part of installation process by bidder.	
22.	Form Factor	Rack Mount up to 2U or lesser	
23.	All required cables		

4. PFS Storage System Qty -1 Set (Comprising of at least 2 x IO Nodes)

S.No	Description	
1.	Parallel File System	
	Technical Specification	
	Lustre based PFS with following specification :-	
	Metadata Storage: more than or equal to 2% of the Usable Storage space offered (using 600GB SAS 10K PM SAS HDDs configured as RAID10 or Similar with one hot-spare.	
	Usable Storage(OST) : >= 120TB usable with RAID6 or similar (using up to 4TB, 7.2K RPM SAS HDDs.	
	Configured as RAID6 volumes with two Global hot-spare disks. Each individual volume to be ≤ 40TB	
	Throughput :> sustained 2GB/s read/write (50:50) performance	
	>=120TB (usable in RAID 6 or equivalent configuration) Parallel File System based storage with 1GBps throughput with 1MB block size for the PFS. At least 2 I/O Nodes in fail over configuration to be quoted.	
	Each I/O Node to be offered with below listed specifications: Minimum 64 or more cores per node, with clock speed of at least 2.35 GHz or more base frequency. Supports DDR4 3200 or better memory. 1.35MB cache per core or higher	
	Redundant Power Supply with at least 80 Plus Platinum efficiency	
	64GB DDR4 3200or higher Mhz memory with ECC	
	At least 2 no. of PCI-E (x16) expansion slots	

	2 x 512GB Data centre grade SSD in RAID1 (for OS)	
	With Hi Speed Interconnect ports–minimum 100Gbps	
	The PFS solution must be capable of handling the loss of the following without interruption: -One Power Supply -One Fan - One HDD for MDT and Two HDDs for OST - Two I/O Server Nodes The I/O server must have redundant paths to the storage.	
Benchmark Report	Benchmark report and Performance demonstration for PFS Throughput . Open-source IOR/IO Zone benchmarks running on compute nodes with 1MB block size. Storage Performance to be measured from compute node using IOR benchmark for 2GBps throughput. Benchmark report must be submitted with bid.	

5. Cooling, Rack, UPS and its monitoring/support/services

SL. No.	Items	
I.	**Rack:** Vendors should propose optimum solution using at the max two 42U Racks with required PDUs and accessories	
II.	**UPS:** Two UPS Units in Failover / Redundant Configuration (1+1). Each UPS of 20 KVA/18 KW should have following features : True online double conversions, IGBT Rectifier & inverter based UPS. Three phases Input/ three phase output with SMF batteries Suitable for 30 Min backup on Full load at 0.9 Load P.f. using 42 Ah X 40 Battery with Each UPS, Input voltage range 340-478V at 100% load, 220-478 V @ 50% load. Input power factor 0.99. Battery Flexible design of 32 to 40 battery. Battery type should be Valve regulated lead-acid (VRLA). Inbuilt Input Isolation Transformer is mandatory required, parallel communication port, RS232, USB, EPO and SNMP interface, BMS interface, Dust Filter at Air Inlet point are required. UPS should be provided with environment monitoring probe to measure temperature and humidity of UPS room. LCD Display indicating all important parameters. UPS software should be compatible to google chrome, Mozilla fire fox and Microsoft internet explorer. Battery open rack, battery interlinks battery breaker, battery to UPS cable as required should be provided with UPS systems. UPS warranty : 3 Year, Battery warranty – at least 2 Years brand Exide / Panasonic or higher brand	
III.	Key Board tray, cable manager, cable route, any other required accessories as per requirement of the above mentioned configuration of master and compute node.	
IV.	Cooling & Compact Data Centre Solution: Scope of this work involves designing the DC considering N+N redundancy, remote manageability & scalability and setting up the infrastructure for high efficiency containing the following essential elements.	

Server Rack and Specifications:

2 x Racks based solution. Racks should bea minimum of 47U to enable maximum utilisation of space within in the rack and also provide scope for future expansion. It should be used to mount and house all servers/network/storage devices in the data centre. The rack has to be designed to meet the safety requirements of the modern data centre. Both the front and rear door should be designed to give active high performance closed loop cooling system with handle & unique key lock system, Cable entry should be entered via the roof plate and via the bottom gland plate without affecting the climatic conditions inside the rack. With depth minimum of 1200MM or higher , of each rack.

Each Rack should include: -

13. 19" Rack frame with sturdy Steel Frame construction with load bearing capacity of 1000Kg.
14. 2 pairs of 47U 19" L Type angles at Front & Rear on 3mm thick punched sections with "U" Marking
15. Front Glass Door with door stiffeners, Rear Sheet Steel Double Door with door stiffeners, Handle with Unique key lock.
16. Set of Side Panels
17. Top & Bottom cover with Fixed & Slide cable gland plate with foam insert at back side for cable entry.
18. 30A, 1Φ, 250 VAC, Vertical Rack PDU with "C" curve 32A single pole MCB with safety guard, power indicator, 16nos of IEC-320-C13 Sockets, 6nos of IEC-320-C19 Sockets, 2nos of EMO-71-1 6/13Amp Universal Sockets, 6 sq.mm 3 core 3 meter cable with Industrial Plug & Mounting brackets hardware for vertical mount PDU or more as per the solution offered by bidder.
19. Base Plinth of 100mm height
20. Earthing studs to be provided provide
21. Hardware pack of 20 (3 packs / Rack)
22. Blanking Panel 1U(12nos /Rack)
23. Cable Manager
24. All front Doors must be equipped with Automatic Door Opening system and rear doors should have exhaust fans in case of cooling failures.

Air-conditioning Unit with Redundancy - 20kVAbased , with (N+1) redundancy

Closed Loop Cooling Solution: IT-optimised design, providing ideal support for "front-to-back" air routing for the 19" installations. DX Type Close Coupled (in a rack) Air-conditioning system with high CFM & sensible cooling Indoor and Outdoor units. The cold air will be provided in front section of the rack and hot air released by the servers will be sucked back into the aircon from the rear of the rack. Cooling capacity should support an average min density per rack 20kVA & should ensure an energy-efficient dissipation of heat. The external unit should support stepless variation of fan speed based on ambient temperature so as to ensure that the refrigeration system pressures are balanced during all weather conditions. The cooling units are to be mounted in the cooling rack adjacent to the IT rack to

ensure that there is no loss of space in the IT Rack.

The System should include :

- Cooling Unit Rack of Size (mm): 400W x 47U H x 1200D with Front & Rear Door & Cable / Pipe entry from either top or bottom cover, 3pt locking system with unique key lock.
- Additionally Base Plinth of 100mm height.
- Cooling Unit Modules with minimum 2nos of EC Fans for maximum efficiency and minimum power consumption in each unit supporting a minimum of 2000CFM.
- Each Cooling Module should have separate control & power module.
- External ODU unit should house the compressor compatible with the Environment Friendly refrigerant.
- Minimum 7'' Touch Screen Display to monitor & control the cooling system.

The cooling system should be with separate indoor units (evaporator) and outdoor units (condenser). The compressor should be part of the outdoor unit to eliminate noise and vibration inside the indoor unit. The Closed Loop Cooling Units should be mounted in a cabinet at the side of the IT racks. The sequence controller should run one cooling unit at a time, and perform a changeover, in case of failure of any of the cooling units. Power connection for outdoor unit: 230V, 1~, 50/Hz.

It should support N+1 redundancy to maintain temperature and humidity profile within ASHRAE TC9.9 or Indian equivalent standard's revised specified limits.

Rack-mountable Fire Detection and Suppression system

Fire detection and suppression system should be equipped with discharge nozzle, cylinder with green UL or equivalent Indian standard listed fire extinguishing agent and piping complete with accessories. The system should include a manual abort option.
Fire detection and suppression system must be not occupy any 'U' space in the IT rack. It should have built-in smoke detection with Smoke Sensors mounted at rear of Rack.

Environmental Monitoring System with Alarm

Remote Monitoring system with Graphical user interface with e-mail alerts. The central monitoring system should be rack-mount and should be able to monitor various sensors. The following parameters to be monitored: Temperature, Humidity, Water Leakage, Fire Detection & Extinguishing, Air-conditioning Units and Door access sensor. It should also monitor & control Automatic Door Opening of the Front Door. It should provide a single interface for remote monitoring of all components and generate email alerts and warnings.

Door Access Control System via Biometric Reader

Standalone Biometric Reader cum Controller. One Reader will open all Doors. – The installation, testing and commissioning of Reader, Controller,

	EM Door lock, cabling, etc. **Ultrasonic Rodent Repeller must also be supplied with the solution**	

6. Cluster Management and other S/W Stack

Operating System	CentOS	
HPC Operating System Support	REQUIRED	
Resource Manager & Scheduler	S/W offered must be a commercial License issued in the name of Jiwaji University	
	Job status reporting	
	Job History Reporting up to 6 months or more	
	Policy-aware workload cum resource manager,	
	Policy aware scheduling	
	Resource-aware scheduling	
	Topology-aware scheduling	
	Dynamic reservation of resource	
	Advance reservation Live support	
	Support of job submission through CLI, Web-services and APIs	
	Load aware power management	
	Fair share support	
	Multiple queues support	
	Multiple partitions support	
	Dynamic partitions support	
	Dynamic queues support	
	Scriptless job submission	
	Heterogeneous cluster support	
	Multi-cluster support	
	MPI aware scheduling	
	Consumable resources scheduling	
	Preemptive and backfill scheduling support	
	Application integration support	
	Live reconfiguration capability	
	SLA/Equivalent	
	GPU and Co Processor Aware scheduling	
	CPU, Multi Core , Multi thread aware scheduling	
	Intuitive web interface to submit and monitor jobs	
Resource Management/Job Scheduling Support	REQUIRED	
File Systems Supported	Lustre , GPFS FROM DAY ONE	
Commercial Licensed Cluster Management S/W (License issued in the name of JIWAJI UNIVERSITY GWALIOR)	Unified system management, monitoring toolset for configuration, diagnosis and management of the system, Cluster manager with provisioning, monitoring and reporting capabilities Support Package and Image based	

	provisioning Support Diskfull and diskless cluster deployment Intuitive web interface to manage and customize the cluster Customizing networks and compute node profiles through GUI Customizing compute nodes (upto changing kernel parameter) Able to Push configuration changes and updates to the compute nodes without reinstalling and rebooting Data Sheet must be submitted with the bid for the product offered. Note : Offered Commercial Licensed Stack must have been deployed by OEM / Bidder earlier as well as part of HPC Solution .	
Software Support for both Serial and Parallel Environment	YES	

7. Other Items

SL No:	Items	
I.	1 Unit of - 17 inch Display, Keyboard, Video and Mouse (KVM) Console with All accessories.	
II.	1 Unit of - 16 Port KVM over IP Switch (USB based) with all required Cables & Accessories.	
III.	1 Unit of - 24 Port ,1 Gbps (RJ-45) Ethernet Switch for Secondry Communication Purpose and 1 unit of 48 Port,1 Gbps (RJ-45) Ethernet Switch for management.	
IV.	36-ports OR MOREbased ,100Gbps, 100% Non-blocking, Switching Fabric (Infiniband) with embedded Subnet Manager for 36 devices(Nodes) or more and with redundant power supply/supplies. All cables (at least 2m in length or more) required for connecting the devices(Nodes) quoted in this tender should be included/bundled	

Supply, Installation and In-house training for HPC :- ❖ Installation of items part of this tender will have to carried out by the vendor. Any specific requirement of vendor regarding installation of above mentioned items must be mentioned in the technical bid so that JIWAJI UNIVERSITY GWALIOR can provide the resources for the same. ❖ 1 day **in-house training** by Certified Professionals at JIWAJI UNIVERSITY GWALIOR including installation of software, bench-marking HPL, monitoring of HPC Cluster for 24 Hours, LINUX commands, HPC Management etc. Scripts for the bench-marking calculations will provide on request.	
<u>Eligibility Criteria and Other Terms</u>	
Mandatory requirements for a bidder to qualify as a participant in this tender: 1. The Server OEM should have executed at least 3 HPC Cluster projects either	

directly or thru system integrators (at least one cluster of the size 100TF CPU-CPU performance)during last 05 years in India at government organizations or in other countries at reputed organizations using an architecture and technologies similar to this tenderered requirement. The credential of an OEM will also be considered if supply done by their authorized partner. Server OEM must have registered office in India. 2. OEM or Bidder must be listed either in India Top100 Supercomputer list or World Top500 Supercomputer list. 3. Storage OEM must have supplied 2 x PFS solutions (50TB or more) earlier in the past along with HPC Solutions during last 10 years in India using an architecture and technologies similar to this tender in India at government organisations details must be submitted with bid. Credential of an OEM will also be considered if supply done by their authorized partner. Storage OEM must have registered office in India 4. Bidder must not be banned or debarred by any government organization in the past during last 5 years. 5. OEMs can authorize multiple bidders to participate with their products. 6. OEM MAF/authorization for Server Nodes, Storage and Cooling Solution provider must be attached with the bid . 7. All warranty and support must be provided by the bidder. 8. The bidder should have at least one service Center in India with service engineers in the relevant field of quoted item. 9. The bidder should have valid ISO certification. Please attach a copy of the certificate. 10. The bidder must be responsible for complete installation and support the infrastructure.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

2. Technical Specification for Scanning Electron Microscope-EDAX

Scanning Electron Microscope (SEM) having fully automated microscope setup with EDS and Sputter Coater - System should have specification similar or better than as given below. The quoted model must be globally available.

Sr. No.	Parameter	Details
1.	Electron Source	LaB6 Lanthanum Hexaboride Electron Emitter The system can also be used with tungsten filament as when required.
2.	Image Resolution	2.0 nm or better at 30 kV (SE detector) 9.0 nm or better at 1kV (SE detector)
3.	Accelerating voltage	Adjustable from 200 eV to 30 KeV or better
4.	Probe Current	1 pA to 2 µA or better
5.	Magnification	10x to 8,00,000x or better
6.	High Vacuum System	Vacuum level in the chamber and column should be equal to or higher than 10^{-3} Pa.Pumping time should be less than 5 minutes High vacuum to low vacuum changeover.
7.	Low Vacuum or variable pressure	Vacuum range – 10 Pa – 400 Pa or better
8.	SEM Chamber	• Large chamber 310 mm (Ø) x 220 mm (h) or better with at least 10 accessory port or better for enhancing the capability of the SEM at later stage. • Should be big enough to accommodate 230mm diameter and 100mm in height or more sample size at analytical working distance.
9.	Specimen Stage	5 axes fully motorized stage with following movements: • X = 80 mm or higher • Y = 100 mm or higher • Z = 35 mm or higher • Tilt from –10° to +90° or better • Rotation: 360 degree continuous • Facility of stage co-ordinate and recall must be provided. • Stage navigation software must be provided. • Joystick for manual control may be provided apart from Software control. • Multi sample holder for holding 7 or more sample stubs,
10.	Standard Detectors	• Chamber SE Detector Chamber BSE detector
11	SEM Automated Operation	• Automatic WD (Focus) & Stigmator, • Contrast & Brightness • Scanning Speed (According to Signal – Noise Ratio) • Gun heating • Gun centering • Column Centering • Vacuum Control • Auto-diagnostics • Direct and continuous control of beam spot size. • Direct and continuous

		control of beam current
12.	SEM Computer	Intel Core i5 or higher, 16GB RAM, SSD 1TB, Windows 10 Pro 64-bit, touch screen
13.	Image Acquisition and display	• 25-inch or more LED screen • Scanning Speed: From 50 ns to 10 ms per pixel adjustable in steps or continuously • Image Size: Selectable up to 8 k x 8 kpixels or better • Image Depth: Up to 16 bits per channel • Image Formats: BMP, TIFF, JPEG, GIF, PNG or PGM, PPM • Point & Line Scan, Image rotation, Image shift, Tilt compensation • Dynamic Focus – in plane or folded plane • Multi Detectors Display: Displaying of up to 2 live detector signals simultaneously infour frames side by side • Detector Mixing: Provision for mixing in user defined ratios & display of different livesignals from same field of view. • Signal averaging using Frame Accumulation or Line Accumulation
14.	SEM Software	• Image Operations • Analysis & Measurement • Image Processing • Image Measurement • Remote control network software with internet TCP / IP open protocols. • Built-in self-diagnostics for system readiness check
15.	Sputter Coater	Sputter coater for Au/Pd coating should be quoted along with required accessories like rotary pump and necessary gas cylinders.
16.	EDS Detector	EDS X-Ray Micro Analysis System Liquid Nitrogen Free EDS detector Acquisition modes: Spectrum from region, point & ID, line scan and elemental mapping are included EDS detector chip/window size 30 mm2 EDS detector with Si3N4 window 129 eV resolution @ Mn Kα Number of pulse processing settings: 3 Maximum input count rate: up to 1,000,000 CPS Maximum output count rate: up to 300,000 CPS Quantification: standard less, ZAF corrected
17.	Consumables	Consumable (like apertures, Rotary pump oil, Rotary pump filter, necessary O rings)required to run instrument for three years to be quoted as standard supply. Following consumables must also be quoted along with the instrument:Carbon conductive adhesive tape – 3 no.s Specimen Stubs – 30 nos.
18.	Calibration sample	Standard sample calibration of SEM and EDS should be provided
19.	On-Line UPS	Suitable on-line UPS (6kVA) or more with minimum 30 hour back up
20.	Essential Accessories	• IR Chamber scope: Chamber view camera (IR CCD) • Touch alarm safety detector for specimen stage and detectors. • TCP / IP Remote control Network interface &software for remote operations and on-line fault diagnostics. • All essential operating accessories like air compressor, water re-circulating chillers,gas cylinders, regulators, chillier, etc, if required have to be included in the offer.

21.	Warranty	The instrument including UPS (if any) quoted for it should be under on-site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable parts. Any repair work or replacement of spares needs to be done on-site, the manufacturer must confirm this in their quotation. **Comprehensive Maintenance Contract (CMC)** : After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected, i.e., the system should be covered for comprehensive warranty for 5 years from the tenderer. All parts including spares should be covered under the warranty and this fact should be clearly and explicitly specified in the tender document. The comprehensive Warranty should cover: (1) All parts including accessories, spares and labour on-site. (2) Free maintenance and service on-site or at factory (if needed) with no cost, and (3) Regular free up-gradation of software if any.
22.	Installatio n and Training	The installation of the instrument should be done by service engineers at free of charge.Operational training should be provided free of charge at the university premises
23.	Spare and consumables availability	Spares and consumables should be available up-to 10 years after installation and commissioning
24.	Price	Please quote CIP and FOR Price DSIR certificate will be provided for custom duty exemption Custom clearance and local transportation are the responsibility of the vendor
25.	Payment Terms	100% Letter of Credit (90% payment against shipping documents, 10% LC after successful installation, commissioning and testing.
26.	Validity of Quotation:	Minimum 3 months.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Scanning Electron Microscope-EDAX **Quantity: 1 no.**

Sr.No.	Parameter	Details	Compliance Yes/No
1.	Electron Source	LaB6 Lanthanum Hexaboride Electron Emitter The system can also be used with tungsten filament as when required.	
2.	Image Resolution	2.0 nm or better at 30 kV (SE detector) 9.0 nm or better at 1kV (SE detector)	
3.	Accelerating voltage	Adjustable from 200 eV to 30 KeV or better	
4.	Probe Current	1 pA to 2 µA or better	
5.	Magnification	10x to 8,00,000x or better	
6.	High Vacuum System	Vacuum level in the chamber and column should be equal to or higher than 10^{-3} Pa.Pumping time should be less than 5 minutes High vacuum to low vacuum changeover.	
7.	Low Vacuum or variable pressure	Vacuum range – 10 Pa – 400 Pa or better	
8.	SEM Chamber	• Large chamber 310 mm (Ø) x 220 mm (h) or better with at least 10 accessory port or better for enhancing the capability of the SEM at later stage. • Should be big enough to accommodate 230mm diameter and 100mm in height or more sample size at analytical working distance.	
9.	Specimen Stage	5 axes fully motorized stage with following movements: • X = 80 mm or higher • Y = 100 mm or higher • Z = 35 mm or higher • Tilt from –10° to +90° or better • Rotation: 360 degree continuous • Facility of stage co-ordinate and recall must be provided. • Stage navigation software must be provided. • Joystick for manual control may be provided apart from Software control. • Multi sample holder for holding 7 or more sample stubs,	
10.	Standard Detectors	• Chamber SE Detector Chamber BSE detector	
11.	SEM Automated Operation	• Automatic WD (Focus) & Stigmator, • Contrast & Brightness • Scanning Speed (According to Signal – Noise Ratio) • Gun heating • Gun centering • Column Centering • Vacuum Control • Auto-diagnostics • Direct and continuous control of beam spot size. • Direct and continuous control of beam current	
12.	SEM Computer	Intel Core i5 or higher, 16GB RAM, SSD 1TB, Windows 10 Pro 64-bit, touch screen	

13.	Image Acquisition and display	• 25-inch or more LED screen • Scanning Speed: From 50 ns to 10 ms per pixel adjustable in steps or continuously • Image Size: Selectable up to 8 k x 8 kpixels or better • Image Depth: Up to 16 bits per channel • Image Formats: BMP, TIFF, JPEG, GIF, PNG or PGM, PPM • Point & Line Scan, Image rotation, Image shift, Tilt compensation • Dynamic Focus – in plane or folded plane • Multi Detectors Display: Displaying of up to 2 live detector signals simultaneously infour frames side by side • Detector Mixing: Provision for mixing in user defined ratios & display of different livesignals from same field of view. • Signal averaging using Frame Accumulation or Line Accumulation	
14.	SEM Software	• Image Operations • Analysis & Measurement • Image Processing • Image Measurement • Remote control network software with internet TCP / IP open protocols. • Built-in self-diagnostics for system readiness check	
15.	Sputter Coater	Sputter coater for Au/Pd coating should be quoted along with required accessories like rotary pump and necessary gas cylinders.	
16.	EDS Detector	EDS X-Ray Micro Analysis System Liquid Nitrogen Free EDS detector Acquisition modes: Spectrum from region, point & ID, line scan and elemental mapping are included EDS detector chip/window size 30 mm2 EDS detector with Si3N4 window 129 eV resolution @ Mn Kα Number of pulse processing settings: 3 Maximum input count rate: up to 1,000,000 CPS Maximum output count rate: up to 300,000 CPS Quantification: standard less, ZAF corrected	
17.	Consumables	Consumable (like apertures, Rotary pump oil, Rotary pump filter, necessary O rings)required to run instrument for three years to be quoted as standard supply. Following consumables must also be quoted along with the instrument:Carbon conductive adhesive tape – 3 no.s Specimen Stubs – 30 nos.	
18.	Calibration sample	Standard sample calibration of SEM and EDS should be provided	
19.	On-Line UPS	Suitable on-line UPS (6kVA) or more with minimum 30 hour back up	

20.	Essential Accessories	• IR Chamber scope: Chamber view camera (IR CCD) • Touch alarm safety detector for specimen stage and detectors. • TCP / IP Remote control Network interface &software for remote operations and on-line fault diagnostics. • All essential operating accessories like air compressor, water re-circulating chillers,gas cylinders, regulators, chillier, etc, if required have to be included in the offer.	
21.	Warranty	The instrument including UPS (if any) quoted for it should be under on-site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable parts. Any repair work or replacement of spares needs to be done on-site, the manufacturer must confirm this in their quotation. **Comprehensive Maintenance Contract (CMC)** : After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected, i.e., the system should be covered for comprehensive warranty for 5 years from the tenderer. All parts including spares should be covered under the warranty and this fact should be clearly and explicitly specified in the tender document. The comprehensive Warranty should cover: (1) All parts including accessories, spares and labour on-site. (2) Free maintenance and service on-site or at factory (if needed) with no cost, and (3) Regular free up-gradation of software if any.	
22.	Installat ion and Training	The installation of the instrument should be done by service engineers at free of charge.Operational training should be provided free of charge at the university premises	
23.	Spare and consumables availability	Spares and consumables should be available up-to 10 years after installation and commissioning	
24.	Price	Please quote CIP and FOR Price DSIR certificate will be provided for custom duty exemption Custom clearance and local transportation are the responsibility of the vendor	
25.	Payment Terms	100% Letter of Credit (90% payment against shipping documents, 10% LC after successful installation, commissioning and testing.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

3. Technical Specification for Physical Parameter Measurement System

S.No.	Parameters	Desired Specifications
1.	Base-System	a) System should be fully liquid cryogen-free, i.e., no requirement of externally supplied liquid Helium and/or liquid Nitrogen at any point of time. Single 2-stage Pul se Tube cryocooler to cool both the superconducting magnet and the temperature control system, providing a low vibration environment for sample measurement. Small amount of helium gas for its fully automated startup and operation.
		b) Any Liquid Helium and/or cold Helium gas flow into sample chamber or to any other parts within the system, and all low temperature operations must be handled in fully automated way through electronic and computer controls. The system should NOT have any manual control in the entire operation of the system.
		c) A dedicated window for monitoring cryostat status.
		d) System should have fully automatic and precise Temperature Controller, External Gas Flow to control the temperature automatically through PC and Software without manual intervention.
		e) The system should be equipped with sufficient number of thermometers at different stages / locations and on cryocooler and magnet to monitor their temperatures through the main operating software.
		f) For Ease of operation Suitable Sample Chamber with 30mm or better Sample space to accommodate sample mounting that, 6should allow accessibility to samples having up to at least six different contacts (for each sample) with corresponding electrical feed throughs. The vendor must supply a pad mask file (in GDSII/Auto CAD format) for the contacts on the sample that can be used by users to prepare their device samples.
		g) Suitable Electronics and controllers like Current, Voltmeter, Temperature Controllers, Lock in amplifiers etc. should be chosen from very Reputed Suppliers, and have the capacity for interfacing over IEEE488.2/Mod BUS standard.
		h) The system must have a large temperature controlled region, or sample chamber 30mm or more, that can either be under vacuum or

		use various exchange gases. Material samples can be measured either with, or without, measurement probes giving users more flexibility in research design and scope.
		i) The capability of the system performance and specifications have to be supported with valid and certified documents and published works along with list of installations worldwide including the contact details (address, phones and emails) of the customers. Supplier should also provide the List of the 100% Cryogen Free High Field 9T or more Magnet systems min 3 installations in India
2.	Superconducting magnet	a) ±9 Tesla or Higher field strength (longitudinal field) b) Sweep rate: Up to 200 Oe/sec. c) Field Homogeneity: ± 0.01 % over 3 cm on axis (for standard measurements without compromising the Specifications ± 0.1% is also OK) d) Magnet has to be cooled by solid conduction without any liquid helium. e) Magnet ramping (9T Or Higher) should not affect the temperature stability f) Thermometer directly on the magnet. Automatic discharge of the magnet if the cryocooler system fails (For example, due to water chiller failure.). g) Magnet control software monitors the temperature of the magnet and cryostat at various locations to ensure proper operation of the magnet system from quenches. h) Bi-polar power supply with over voltage protection and indication. i) Various operating modes: Linear, Oscillating, No Overshoot must be given in details. There should be no overshoot in the field or the tolerable overshoot in "No Overshoot" mode should be specified for various field strengths. j) A built in magnetic shield to maintain 5 gauss line < 30 cm from the surface of the cryostat cabinet allowing the system to be installed closer to other sensitive instrument for better lab space utilization (provide data). k) Magnet should be protected from quenches. l) Ultra Low Field to reduce the remnant field in the range of 20 to 30 mT with step of 1microTesla (this point should be included especially for higher field magnets like 9T and above)

3.	Temperature Control	a) Cryostat assembly continuous low temperature operation. All the operations must be completely automatic without user intervention. b) The system should enable cooling of samples from highest temperature to the lowest at the highest specified cooling rate at any given magnetic field of up to ±9 T or Higher magnetic Field without affecting the system performance including the heating of magnet. The same procedures should be hold for heating of the samples as well. c) System should have sophisticated temperature control and provide seamless transition between high temperature (400 K) with minimal cooling power needs, intermediate temperature with rapid slewing and large cooling needs and stable operation near the base temperature (< 1.8K) with cooling provided by evaporation of liquid helium. d) System should have sophisticated temperature control and provide seamless transition between high temperature (400 K) with minimal cooling power needs, intermediate temperature with rapid slewing and large cooling needs and stable operation near the base temperature (< 1.8K) with cooling provided by evaporation of liquid helium e) The sample chamber has to be sealed for controllable sample environment. Suitable Gas Handling mechanism to control the Sample temperature precisely. f) Temperature range of 1.8 (or lower) to 400 K with milli-Kelvin stability and accuracy. g) Temperature stability should be at least ±0.5 % for T < 10 K and ±0.05 % for T > 10 K irrespective of the magnitude of applied magnetic field. h) Accuracy: ± 1% and sweeping rate 0.01 to 30 K/min (10 K/min Heating) irrespective of the magnitude of applied magnetic field. i) Fast Settle, No Overshoot, and Sweep mode. j) Temperature control should be fully automated. k) System should have fully automatic and precise low Temperature Controller for continuous low temperature operation to allow the measurements < 4.2K continuously for long time l) Various modes of Fast settle, No overshoot, and sweep mode must be given in details.
4.	Vacuum pumps and fittings	System should come with suitable Vacuum pumps and fittings along with vacuum gauges, meter, standard vacuum coupling essential for the uninterrupted functioning of the instrument and its various

		measurements options must be included.
5.	Data acquisition and analysis	a) Licensed windows based operating software and State- of- the- art computer control system compatible with the measurement options with all the necessary hardware interface with National instruments (Or equivalent) data acquisition card. b) The software should allow user to select the type of measurement to be made, to create, store and retrieve measurement sequences and customize the range of variables measured at each point of a sequence. A licensed copy of the LabVIEW should be provided, allowing customer the access Temperature Control & Magnet control and other electronics to set his own customized measurement c) Remote user access to the system via Internet. d) The software must allow the users to remotely control and monitor experiments over any internet connection. e) Any necessary analysis software commonly offered by the bidder must be included.
6.	Accessories, tools, and documentation	A complete set of spare fuses, O-rings, Hoses for chiller unit, Helium gas regulators, tools needed for user tasks, and complete set of manuals / documentation exhibiting compliance must be provided. A service manual with complete circuit diagram and PCB layout for all equipment to be provided with the instruments.
7.	Essential measurements	**a) *Electrical transport*** i) Both ac and dc electrical transport measurements must be possible. ii) 4-wire & 2-wire resistivity and simultaneous Hall effect measurement, I-V characteristics. The software should be programmable for differential resistance measurement (dV/dI vs. I or dV/dI vs V). iii) Simultaneous measurements of at least two samples with independent source and measure options must be provided. iv) A high impedance measurement using 2-wire measurement method must be possible for samples with impedance up to 5 GΩ or higher. v) Current Source: DC & AC, 10nA (or less) to 8 mA (or more) for both DC as well as AC should be possible. Frequency range of 1 Hz to 200 Hz or wider for ac measurements should be possible. vi) For sample mounting, in addition to standard mounting, an option for 16 pins (or higher) lead less chip carrier (LCC) must be

		provided. vii) Automated option for Van der Pauw and Hall effect measurements must be possible. **b) *DC Magnetization*** i) Temperature Range: 1.8K (or lower)– 400K (or above). ii) Magnetic Field: ≥ ± 14 Tesla. iii) Top loading sample arrangement, sample mounting. iv) VSM measurements should be possible: VSM sample holders for powder, bulk (polycrystalline and single crystal samples) and thin- films. v) VSM Oscillation Frequency (calibrated): Range of 20 - 60 Hz or wider. vi) RMS Sensitivity at Field B: 5 x 10 -6 emu or better vii) Suitable sample holders for powder, pellets and thin films. Possibilities for measurements in parallel & perpendicular to applied magnetic Field must be provided. viii) Measurement Range: 10 -6 to 100 emu ix) Maximum amplitude should be 2mm or higher x) VSM must support software-based auto positioning of the sample xi) coil with suitable bore to adapt the sample of 5 mm or smaller xii) NIST based samples must be provided for calibration of magnetic moment at low and high magnetic fields/temperatures **c) *AC Susceptibility*** i) Temperature Range: 2 K – 350 K (or wider) ii) Magnetic Field: ≥ ± 14 Tesla. iii) Accuracy: 5% or better over entire temperature and field range. iv) Frequency Range: 10Hz – 10KHz or wider. v) Must have higher harmonic measurement option vi) Sensitivity should be 10 -7 emu OR better(for AC measurements) and 3×10 -5 emu (DC measurements). vii) Phase Setting accuracy (Real & Imaginary part) : 0.1 0 **d) *Heat Capacity*** i) Temperature Range: 2 K – 300 K or larger ii) Magnetic Field: ±9 Tesla or higher iii) Measurement Accuracy: 5% or better over 2K – 300K iv) Heat Capacity resolution: 10 nJ/mole.K or better at 2 K

		e) Thermal Transport *i*) Temperature range 1.8 K to 350K or higher, with a capability to measure thermal conductivity, Seebeck coefficient, thermoelectric figure of merit ii) Thermal conductance measurement accuracy: ± 5 % or better iii) Typical accuracy of the Seebeck coefficient: ± 5 % or better iv) Seebeck coefficient measurement range: 1 μV/K to 1 V/K or wider.
8.	***Water Chiller Unit***	Suitable closed cycle water chiller unit with the suitable capacity for trouble free continuous running of the main PPMS system.
9.	***Multi-Function Probe***	(a) Consistent with the optional specification 1, the multi-function probe should facilitate easy access to the axial ports and connectors which can be configured to route electrical and thermometer connectors to the sample space. Should have facility to mount the sample Parallel or Perpendicular to the Magnetic Field. Suitable Cernox Temperature sensor should be incorporated to precisely control the temp from 1.6K to 400K. (b) There should be direct axial electrical and other ports to sample stage provided to install any needed electrical and thermometer leads. (c) It must have at least 2 sets of 4 electrical leads on sample PCB interface for electrical transport experiments 12 Pin Fisher socket for sample electrical contacts and 6 pin Fisher sockets for Heater and thermometer wiring. (d) Sample stage should have integrated thermometer (e) Sufficient supporting information must be provided with the offer.
10.	***Installation requirements***	a) Bid should contain information about the requirement of helium gas replenishment. b) Pre-installation site preparation requirements to be included and specified along with the bid. c) The bid should also indicate what kind of service/maintenance is required for the system. Whether this service has to be carried out by a company engineer or can it be done by trained service personal within India.
11.	***Demonstration and standard samples***	Standard samples to be provided by the company for testing the instruments at the time of installation on site to the quoted accuracy in the given technical specifications for the demonstration of the

		performance of the equipment. Guaranteed specifications to be demonstrated at the time of installation. Any necessary standard samples for that purpose should be brought by the service engineers.
12.	***Additional requirements***	a) In addition to the technical specifications listed in this table, the bidder must satisfy all terms listed under optional items table below for future upgradability. b) The offer must be supported with the measurement data and refereed literature. Mere statement of compliance will not be considered sufficient. Technical evaluation by the institute may include demonstration to verify functionalities and capabilities of the system quoted. Vendor must submit factory acceptance test procedures supported with relevant printed literature and certificates. c) **Installation in India:** List of similar equipments installed during last five years in institutes like IIT/NISER/IISER/NIT's/Universities/DAE Units/Defence units in India with Contact person name, address and phone number, email id must be specified. The vendor must have supplied and installed at least 3 to 4 similar equipment in the above institutes in last five years plus the track record of old cryogen free High magnetic field systems in past 10 years. d) No part shipment will be acceptable.
13.	***Warranty***	The instrument including UPS (if any) quoted for it should be under on-site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable parts. Any repair work or replacement of spares needs to be done on-site, the manufacturer must confirm this in their quotation. **Comprehensive Maintenance Contract (CMC)** : After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected, i.e., the system should be covered for comprehensive warranty for 5 years from the tenderer. All parts including spares should be covered under the warranty and this fact should be clearly and explicitly specified in the tender document. The comprehensive Warranty should cover: (1) All parts including accessories, spares and labour on-site. (2) Free maintenance and service on-site or at factory (if needed) with no cost, and (3) Regular free up-gradation of software if any.

14.	***Power Supply***	Should meet Indian Power standards preferably without use of external converters.
15.	***System Consumable Parts***	Basic frequently required spares should be provided for the entire period of extended warranty and for an extended period of next 5-years. A list of these items should be attached with the quotation.
16.	***Installation and Commissioning***	i) Installation, complete interfacing of the system with its subsystems, and commissioning is to be carried out by the vendor's factory-trained engineers, followed by a demonstration of the system's performance to the user's complete satisfaction. ii) An estimated time schedule for installation, commissioning and training must be provided.
17.	***Training***	i) The manufacturer/supplier of Custom Physical Parameter Measurement System should provide at least seven days onsite training initially during installation. ii) The supplier or manufacturer should also provide dedicated five days advanced training subsequent to the above training installation. iii) Regular follow up training every six months during the period of extended warranty on mutually convenient dates for hardware, software and application to the laboratory personnel in the installation, operation and maintenance of the instruments.
18.	***Support and Service***	1. The manufacturer and/or their Indian representative must have at least two qualified and factory trained service engineer in India to be able to attend to service at Jiwaji University, Gwalior within 48 hours on submitting a complaint. Training certificates from the manufacturer have to be provided with the tender. 2. For warranty period only factory trained and certified engineers are acceptable to attend the service. 3. The response time with an engineer on site must be less than 48 hours from the notification of the failure. The company must provide evidence that it can fulfil this requirement. 4. In case the parts are required to be imported for repairs, the same should be made available within 2 weeks from the date of reporting of the issue. Any extension in this time will need to be compensated by the manufacturer by extending the comprehensive warranty by the excess period taken (i.e. period beyond 2 weeks) in completing the repairs. 5. A 10% performance guarantee will need to be maintained during the period of extended warranty.
26.	Validity of Quotation:	Minimum 3 months.

l. No.	List of optional items
1	***Measurements***
	a) Optical and optoelectronic measurements
	The system should have 4 quartz windows connected to the cold space so that optical measurements like photoluminescence (using externally coupled light sources through an optical fiber, with external detectors using another set of optical fibers) and electroluminescence (using electrical feed through for stimulus, and optical fibers for out coupled light for optoelectronic measurements) can be carried out. All optical fibers (SMA905/FC1 only) should be external to the cold space and never undergo thermal cycling during use. This may be accomplished by providing a specially designed annular optical assembly that mounts externally in a unique way on to the 4 quartz windows and uses 45 degree mirrors to couple light signals in/out of 4 fixed (but user replaceable) optical fibers, which are thus never bent inside the system. The optical assembly should be thin enough to mount in the annular space between the cold space and the enclosing magnet so that optical and optoelectronic measurements can be made under the system magnetic field. The assembly should be easily user mountable in a unique and easily identifiable manner for quick mounting and removal for different experiments. The length of the optical fibers should be sufficient to connect to external equipment such as light sources, optical power meters, spectrometers, etc.
	b) Magneto Optical Measurements:
	i) Consistent with specification a) above, this option should allow a sample to be illuminated by an external light source while conducting magnetic measurements. Option should include all the necessary parts and components to generate light for a certain wavelength and couple it in a fiber optic to transfer the light to the sample during magnetic measurement.
	ii) This option must be provided with a high power Xenon lamp source with housing, Variable lamp power supply, multiple position filter wheel, set of bandpass filters, Dichroic mirror, Fiber coupling optics and SMA connector for the fiber delivery and safety components.
	iii) A high-resolution CCD cooled spectrometer, such as Acton PI, along with needed fiber optic coupling should be provided.
	iv) Temperature range 1.8 K to 400K
	c) FMR measurements:
	i) Frequency bandwidth: 2-8 GHz or wider
	ii) Temperature range: 5 K -350 K or wider
	iii) Magnetic field: up to 9 T or higher
	d) Electrical Transport measurements
	i) Possibility for two axes rotation of samples in magnetic field should be included.
2.	Additional accessories to enable use of He_3 as the working gas for refrigeration.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Physical Parameter Measurement System **Quantity: 1 no.**

S.No.	Parameters	Desired Specifications	Compliance Yes/No
1.	Base-System	a) System should be fully liquid cryogen-free, i.e., no requirement of externally supplied liquid Helium and/or liquid Nitrogen at any point of time. Single 2-stage Pulse Tube cryocooler to cool both the superconducting magnet and the temperature control system, providing a low vibration environment for sample measurement. Small amount of helium gas for its fully automated startup and operation.	
		b) Any Liquid Helium and/or cold Helium gas flow into sample chamber or to any other parts within the system, and all low temperature operations must be handled in fully automated way through electronic and computer controls. The system should NOT have any manual control in the entire operation of the system.	
		c) A dedicated window for monitoring cryostat status.	
		d) System should have fully automatic and precise Temperature Controller, External Gas Flow to control the temperature automatically through PC and Software without manual intervention.	
		e) The system should be equipped with sufficient number of thermometers at different stages / locations and on cryocooler and magnet to monitor their temperatures through the main operating software.	
		f) For Ease of operation Suitable Sample Chamber with 30mm or better Sample space to accommodate sample mounting that, 6should allow accessibility to samples having up to at least six different contacts (for each sample) with corresponding electrical feed throughs. The vendor must supply a pad mask file (in GDSII/Auto CAD format) for the contacts on the sample that can be used by	

		users to prepare their device samples.	
		g) Suitable Electronics and controllers like Current, Voltmeter, Temperature Controllers, Lock in amplifiers etc. should be chosen from very Reputed Suppliers, and have the capacity for interfacing over IEEE488.2/Mod BUS standard.	
		h) The system must have a large temperature controlled region, or sample chamber 30mm or more, that can either be under vacuum or use various exchange gases. Material samples can be measured either with, or without, measurement probes giving users more flexibility in research design and scope.	
		i) The capability of the system performance and specifications have to be supported with valid and certified documents and published works along with list of installations worldwide including the contact details (address, phones and emails) of the customers. Supplier should also provide the List of the 100% Cryogen Free High Field 9T or more Magnet systems min 3 installations in India	
2.	Superconducting magnet	a) ±9 Tesla or Higher field strength (longitudinal field) b) Sweep rate: Up to 200 Oe/sec. c) Field Homogeneity: ± 0.01 % over 3 cm on axis (for standard measurements without compromising the Specifications ± 0.1% is also OK) d) Magnet has to be cooled by solid conduction without any liquid helium. e) Magnet ramping (9T Or Higher) should not affect the temperature stability f) Thermometer directly on the magnet. Automatic discharge of the magnet if the cryocooler system fails (For example, due to water chiller failure.). g) Magnet control software monitors the temperature of the magnet and cryostat at various locations to ensure proper operation of the magnet system from quenches. h) Bi-polar power supply with over voltage protection and indication. i) Various operating modes: Linear, Oscillating, No	

		Overshoot must be given in details. There should be no overshoot in the field or the tolerable overshoot in "No Overshoot" mode should be specified for various field strengths. j) A built in magnetic shield to maintain 5 gauss line < 30 cm from the surface of the cryostat cabinet allowing the system to be installed closer to other sensitive instrument for better lab space utilization (provide data). k) Magnet should be protected from quenches. l) Ultra Low Field to reduce the remnant field in the range of 20 to 30 mT with step of 1microTesla (this point should be included especially for higher field magnets like 9T and above)	
3.	Temperature Control	a) Cryostat assembly continuous low temperature operation. All the operations must be completely automatic without user intervention. b) The system should enable cooling of samples from highest temperature to the lowest at the highest specified cooling rate at any given magnetic field of up to ±9 T or Higher magnetic Field without affecting the system performance including the heating of magnet. The same procedures should be hold for heating of the samples as well. c) System should have sophisticated temperature control and provide seamless transition between high temperature (400 K) with minimal cooling power needs, intermediate temperature with rapid slewing and large cooling needs and stable operation near the base temperature (< 1.8K) with cooling provided by evaporation of liquid helium. d) System should have sophisticated temperature control and provide seamless transition between high temperature (400 K) with minimal cooling power needs, intermediate temperature with rapid slewing and large cooling needs and stable operation near the base temperature (< 1.8K) with cooling provided by evaporation of liquid helium e) The sample chamber has to be sealed for controllable sample environment. Suitable Gas Handling mechanism to control the Sample temperature precisely. f) Temperature range of 1.8 (or lower) to 400 K with	

		milli-Kelvin stability and accuracy. g) Temperature stability should be at least ±0.5 % for T < 10 K and ±0.05 % for T > 10 K irrespective of the magnitude of applied magnetic field. h) Accuracy: ± 1% and sweeping rate 0.01 to 30 K/min (10 K/min Heating) irrespective of the magnitude of applied magnetic field. i) Fast Settle, No Overshoot, and Sweep mode. j) Temperature control should be fully automated. k) System should have fully automatic and precise low Temperature Controller for continuous low temperature operation to allow the measurements < 4.2K continuously for long time l) Various modes of Fast settle, No overshoot, and sweep mode must be given in details.	
4.	Vacuum pumps and fittings	System should come with suitable Vacuum pumps and fittings along with vacuum gauges, meter, standard vacuum coupling essential for the uninterrupted functioning of the instrument and its various measurements options must be included.	
5.	Data acquisition and analysis	a) Licensed windows based operating software and State- of- the- art computer control system compatible with the measurement options with all the necessary hardware interface with National instruments (Or equivalent) data acquisition card. b) The software should allow user to select the type of measurement to be made, to create, store and retrieve measurement sequences and customize the range of variables measured at each point of a sequence. A licensed copy of the LabVIEW should be provided, allowing customer the access Temperature Control & Magnet control and other electronics to set his own customized measurement c) Remote user access to the system via Internet. d) The software must allow the users to remotely control and monitor experiments over any internet connection. e) Any necessary analysis software commonly offered by the bidder must be included.	

6.	Accessories, tools, and documentation	A complete set of spare fuses, O-rings, Hoses for chiller unit, Helium gas regulators, tools needed for user tasks, and complete set of manuals / documentation exhibiting compliance must be provided. A service manual with complete circuit diagram and PCB layout for all equipment to be provided with the instruments.	
7.	Essential measurements	**a) *Electrical transport*** i) Both ac and dc electrical transport measurements must be possible. ii) 4-wire & 2-wire resistivity and simultaneous Hall effect measurement, I-V characteristics. The software should be programmable for differential resistance measurement (dV/dI vs. I or dV/dI vs V). iii) Simultaneous measurements of at least two samples with independent source and measure options must be provided. iv) A high impedance measurement using 2-wire measurement method must be possible for samples with impedance up to 5 GΩ or higher. v) Current Source: DC & AC, 10nA (or less) to 8 mA (or more) for both DC as well as AC should be possible. Frequency range of 1 Hz to 200 Hz or wider for ac measurements should be possible. vi) For sample mounting, in addition to standard mounting, an option for 16 pins (or higher) lead less chip carrier (LCC) must be provided. vii) Automated option for Van der Pauw and Hall effect measurements must be possible. **b) *DC Magnetization*** i) Temperature Range: 1.8K (or lower)– 400K (or above). ii) Magnetic Field: ≥ ± 14 Tesla. iii) Top loading sample arrangement, sample mounting. iv) VSM measurements should be possible: VSM sample holders for powder, bulk (polycrystalline and single crystal samples) and thin- films. v) VSM Oscillation Frequency (calibrated): Range of 20 - 60 Hz or wider. vi) RMS Sensitivity at Field B: 5 x 10 -6 emu or better vii) Suitable sample holders for powder, pellets and thin	

		films. Possibilities for measurements in parallel & perpendicular to applied magnetic Field must be provided. viii) Measurement Range: 10 -6 to 100 emu ix) Maximum amplitude should be 2mm or higher x) VSM must support software-based auto positioning of the sample xi) coil with suitable bore to adapt the sample of 5 mm or smaller xii) NIST based samples must be provided for calibration of magnetic moment at low and high magnetic fields/temperatures **c) *AC Susceptibility*** i) Temperature Range: 2 K – 350 K (or wider) ii) Magnetic Field: ≥ ± 14 Tesla. iii) Accuracy: 5% or better over entire temperature and field range. iv) Frequency Range: 10Hz – 10KHz or wider. v) Must have higher harmonic measurement option vi) Sensitivity should be 10 -7 emu OR better(for AC measurements) and 3×10 -5 emu (DC measurements). vii) Phase Setting accuracy (Real & Imaginary part) : 0.1 0 **d) *Heat Capacity*** i) Temperature Range: 2 K – 300 K or larger ii) Magnetic Field: ±9 Tesla or higher iii) Measurement Accuracy: 5% or better over 2K – 300K iv) Heat Capacity resolution: 10 nJ/mole.K or better at 2 K **e) Thermal Transport** *i*) Temperature range 1.8 K to 350K or higher, with a capability to measure thermal conductivity, Seebeck coefficient, thermoelectric figure of merit ii) Thermal conductance measurement accuracy: ± 5 % or better iii) Typical accuracy of the Seebeck coefficient: ± 5 % or better	

		iv) Seebeck coefficient measurement range: 1 μV/K to 1 V/K or wider.	
8.	***Water Chiller Unit***	Suitable closed cycle water chiller unit with the suitable capacity for trouble free continuous running of the main PPMS system.	
9.	***Multi-Function Probe***	(a) Consistent with the optional specification 1, the multi-function probe should facilitate easy access to the axial ports and connectors which can be configured to route electrical and thermometer connectors to the sample space. Should have facility to mount the sample Parallel or Perpendicular to the Magnetic Field. Suitable Cernox Temperature sensor should be incorporated to precisely control the temp from 1.6K to 400K. (b) There should be direct axial electrical and other ports to sample stage provided to install any needed electrical and thermometer leads. (c) It must have at least 2 sets of 4 electrical leads on sample PCB interface for electrical transport experiments 12 Pin Fisher socket for sample electrical contacts and 6 pin Fisher sockets for Heater and thermometer wiring. (d) Sample stage should have integrated thermometer (e) Sufficient supporting information must be provided with the offer.	
10.	***Installation requirements***	a) Bid should contain information about the requirement of helium gas replenishment. b) Pre-installation site preparation requirements to be included and specified along with the bid. c) The bid should also indicate what kind of service/maintenance is required for the system. Whether this service has to be carried out by a company engineer or can it be done by trained service personal within India.	
11.	***Demonstration and standard samples***	Standard samples to be provided by the company for testing the instruments at the time of installation on site to the quoted accuracy in the given technical specifications for the demonstration of the performance of the equipment. Guaranteed specifications to be demonstrated at the time of installation. Any necessary standard samples for that purpose should be brought by	

		the service engineers.	
12.	***Additional requirements***	a) In addition to the technical specifications listed in this table, the bidder must satisfy all terms listed under optional items table below for future upgradability. b) The offer must be supported with the measurement data and refereed literature. Mere statement of compliance will not be considered sufficient. Technical evaluation by the institute may include demonstration to verify functionalities and capabilities of the system quoted. Vendor must submit factory acceptance test procedures supported with relevant printed literature and certificates. c) **Installation in India:** List of similar equipments installed during last five years in institutes like IIT/NISER/IISER/NIT's/Universities/DAE Units/Defence units in India with Contact person name, address and phone number, email id must be specified. The vendor must have supplied and installed at least 3 to 4 similar equipment in the above institutes in last five years plus the track record of old cryogen free High magnetic field systems in past 10 years. d) No part shipment will be acceptable.	
13.	***Warranty***	The instrument including UPS (if any) quoted for it should be under on-site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable parts. Any repair work or replacement of spares needs to be done on-site, the manufacturer must confirm this in their quotation. **Comprehensive Maintenance Contract (CMC)** : After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected, i.e., the system should be covered for comprehensive warranty for 5 years from the tenderer. All parts including spares should be covered under the warranty and this fact should be clearly and explicitly specified in the tender document. The comprehensive Warranty should cover: (1) All parts including accessories, spares and labour on-site. (2) Free	

		maintenance and service on-site or at factory (if needed) with no cost, and (3) Regular free up-gradation of software if any.	
14.	***Power Supply***	Should meet Indian Power standards preferably without use of external converters.	
15.	***System Consumable Parts***	Basic frequently required spares should be provided for the entire period of extended warranty and for an extended period of next 5-years. A list of these items should be attached with the quotation.	
16.	***Installation and Commissioning***	i) Installation, complete interfacing of the system with its subsystems, and commissioning is to be carried out by the vendor's factory-trained engineers, followed by a demonstration of the system's performance to the user's complete satisfaction. ii) An estimated time schedule for installation, commissioning and training must be provided.	
17.	***Training***	i) The manufacturer/supplier of Custom Physical Parameter Measurement System should provide at least seven days onsite training initially during installation. ii) The supplier or manufacturer should also provide dedicated five days advanced training subsequent to the above training installation. iii) Regular follow up training every six months during the period of extended warranty on mutually convenient dates for hardware, software and application to the laboratory personnel in the installation, operation and maintenance of the instruments.	
18.	***Support and Service***	1. The manufacturer and/or their Indian representative must have at least two qualified and factory trained service engineer in India to be able to attend to service at Jiwaji University, Gwalior within 48 hours on submitting a complaint. Training certificates from the manufacturer have to be provided with the tender. 2. For warranty period only factory trained and certified engineers are acceptable to attend the service. 3. The response time with an engineer on site must be less than 48 hours from the notification of the failure. The company must provide evidence that it can fulfil this	

		requirement. 4. In case the parts are required to be imported for repairs, the same should be made available within 2 weeks from the date of reporting of the issue. Any extension in this time will need to be compensated by the manufacturer by extending the comprehensive warranty by the excess period taken (i.e. period beyond 2 weeks) in completing the repairs. 5. A 10% performance guarantee will need to be maintained during the period of extended warranty.	

l. No.		**List of optional items**	
1		***Measurements***	
		a) Optical and optoelectronic measurements	
		The system should have 4 quartz windows connected to the cold space so that optical measurements like photoluminescence (using externally coupled light sources through an optical fiber, with external detectors using another set of optical fibers) and electroluminescence (using electrical feed through for stimulus, and optical fibers for out coupled light for optoelectronic measurements) can be carried out. All optical fibers (SMA905/FC1 only) should be external to the cold space and never undergo thermal cycling during use. This may be accomplished by providing a specially designed annular optical assembly that mounts externally in a unique way on to the 4 quartz windows and uses 45 degree mirrors to couple light signals in/out of 4 fixed (but user replaceable) optical fibers, which are thus never bent inside the system. The optical assembly should be thin enough to mount in the annular space between the cold space and the enclosing magnet so that optical and optoelectronic measurements can be made under the system magnetic field. The assembly should be easily user mountable in a unique and easily identifiable manner for quick mounting and removal for different experiments. The length of the optical fibers should be sufficient to connect to external equipment such as light sources, optical power meters, spectrometers, etc.	
		b) Magneto Optical Measurements:	
		i) Consistent with specification a) above, this option should allow a sample to be illuminated by an external light source while conducting magnetic measurements. Option should include all the necessary parts and components to generate light for a certain wavelength and couple it in a fiber optic to transfer the light to the sample during magnetic measurement.	

		ii) This option must be provided with a high power Xenon lamp source with housing, Variable lamp power supply, multiple position filter wheel, set of bandpass filters, Dichroic mirror, Fiber coupling optics and SMA connector for the fiber delivery and safety components.	
		iii) A high-resolution CCD cooled spectrometer, such as Acton PI, along with needed fiber optic coupling should be provided.	
		iv) Temperature range 1.8 K to 400K	
		c) FMR measurements:	
		i) Frequency bandwidth: 2-8 GHz or wider	
		ii) Temperature range: 5 K -350 K or wider	
		iii) Magnetic field: up to 9 T or higher	
		d) Electrical Transport measurements	
		i) Possibility for two axes rotation of samples in magnetic field should be included.	
2.		Additional accessories to enable use of He_3 as the working gas for refrigeration.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

4. Technical Specification for Behaviour and Activity Test System

S.No.	Parameters Desired Specifications
(a) Specification for Open Field Animal Activity Meter The instrument should essentially have the following	
1.	Activity meter should be designed for the Open Field Anxiety and Exploratory Tests for 4 animals.
2.	System should be using latest technology to quantify loco motor activity and trace the animal's path for behavioral analysis.
3.	Systems can support up to 16 stations on a single PC.
4.	System should have four cages, and sensors, brackets, interface, and Windows software.
5.	System should have ability to record the interruption of beams along the horizontal axes (X, Y & Z) provide coordinates that identify animal location.
6.	Software should be able to records these coordinates for later playback and analysis.
7.	System can be adapted to perform automated measurements for other tests, such as the Contextual Place Preference Test, Hole Poke Exploratory Test, and Light/Dark Transition Test.
8.	The system should record distance traveled, resting time, stereotypic time, ambulatory time, burst of stereotypic time, horizontal and ambulatory beam breaks, raw data storage (GLP compliant), validation protocols and Re analysis data.
9.	The instrument should be complete in itself with all the essential attachments, UPS, PC/MAC compatible software, standard i5 laptop, etc. Any additional accessory, required for upgradation or optional attachment be quoted separately.
10.	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.
11.	**Comprehensive Maintenance Contract (CMC):** After the completion of 3 year OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
(b) Technical Specifications for Rotarod For Rat & Mice The system should have the following essentials,	
1.	Rotarod should be capable of testing up to four animals simultaneously for their ability to maintain themselves upright on a rotating rod.
2.	There should be an option to select accelerating or constant speed mode of operation as well as a slow speed waiting mode before acceleration takes place.
3.	Speed and acceleration rate should be programmable.
4.	An animal fall should be detected by infrared photo-cells.
5.	Software should allow programmed intervals for speed changes, even spinning direction, should be programmed into a specific protocol of the user's design.
6.	It should allow monitoring of looping behavior; length of trial and number of loops.
7.	Data should be generated in a CSV format that can be easily opened by most statistical analysis programs.
8.	Number of Exercise Lanes should be 4.
9.	Rotarod Spindle Speed Range should be 0 - 99.9 RPM
10.	Acceleration Increments should be 0.1 RPM per second. to 20.0 RPM per second.
11.	Animal's absence from rod assembly should be monitored by Scanning infrared beam diagnostic for GLP validation.

12.	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.
13.	**Comprehensive Maintenance Contract (CMC):** After the completion of 3 year OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
14.	The instrument should be complete in itself with all the essential attachments, UPS, PC/MAC compatible software, standard i5 laptop, etc. Any additional accessory, required for upgradation or optional attachment be quoted separately.
15.	(32) sensors.
16.	The software should have facility to record the passive rotation time, running duration, speed at the time of fall and distance travelled with facility for self-check and
(c) Specifications for Grip Strength Meter The system should have the following essentials,	
1.	System should assess neuromuscular function by sensing the peak amount of force an animal applies in grasping specially designed pull bar assemblies.
2.	System performance should be with precision force gauges in such a manner as to retain the peak force applied on a digital display, the values may be either recorded manually or sent to an attached computer via USB.
3.	System should support Fore and hind limb assessments.
4.	System readings must be obtained in pounds, kilograms, or newtons all values accurately within +/- 0.25% of full-scale capacity, force gauges are offered in 0-1Kg and 0-5Kg ranges.
5.	System defines Objective assessment of neuromuscular performance specially designed pull bar assemblies, simple operation, selectable force units.
6.	System should support standard pull bar assemblies are offered for rats and mice.
7.	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.
8.	**Comprehensive Maintenance Contract (CMC):** After the completion of 3 year OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
9.	The instrument should be complete in itself with all the essential attachments, UPS, PC/MAC compatible software, standard i5 laptop, etc. Any additional accessory, required for upgradation or optional attachment be quoted separately.
(d) Technical Specification Multi-Configuration Behavior Video tracking and mazes with optogenetic studies complete system for small animal The system should have the following essential requirements,	
1.	Multi-configuration behavior tracking equipment for small animal is essential for study of different conditions, like anxiety, locomotors activity, depression, memory learning andstress response from small animal in experimental condition
2.	Multi-configuration behavior tracking system setup should consists ofOpen field enclosure, hole board insert, novel objects, light/dark box enclosure, conditioned place preference enclosure and mazes (Elevated plus maze, Radial Maze, T-Maze, Y-maze and Morris Water Maze for rat and mice.).

3.	Multi-Configuration Behavior tracking equipment should be a completely automated system designed to make behavioral tracking convenient and affordable for a range of behavioral tests.	
4.	It should be a multiple tests system with a single base consists of behavior tracking Software, digital interface device, universal Base Plate with IR Photo beam Array, USB CMOS Camera and Camera Accessories including locally made camera stand.	
5.	Camera should be B&W USB 2.0 CMOS with separate lens vari-focal, 2.7-13.5mm and 15 ft USB 2.0 Male to Mini cable. A total of 06 cameras to be provided	
6.	IR photo beam array should provide a 'curtain' of photo beams and should be used to detect when an animal rears and also be as a movement detector for generation of reliable movement 'counts' in circumstances.	
7.	IR photo beam array should plugs directly into digital Interface device within 100 cm for rat, maximum working distance is 50cm separation with 12.5mm space between beams (across the array) and also with option for 40cm for mice	
8.	Tracking software should be flexible and can be used to track the behavior of rodent in any types of mazes with as many as sixteen pieces of camera.	
9.	It should include optogenetic interface with 4 channels, digital output etc.	
10.	The software should have the facility to create password protected individual id to comply with GLP and the save data should also be password protected.	
11.	It should support an array of cameras like USB digital cameras, fire wire cameras, DV cam coder, and CCTV camera, or analog pre-recorded video.	
12.	It should have the ability to track animal head, center and tail and can make an orientation between these three.	
13.	It should have the facility for sequence setting to detect specific transitions of the animal with in the apparatus and also have the facility to identify specific location in the apparatus.	
14.	System should automatically score over hundred different parameters like total distance travelled, average speed, mobile, immobile time and number of episode, total active, inactive time and episodes, longest, shortest active & inactive episodes, no of line crossings, absolute turn angle, total distance travelled by animal's head, animal body clock wise and anti-clockwise rotation, visited zone list, number of rearing episode, grooming of the animal and Overall: distance, speed, direction, Zones: Latency to enter, time in, distance from.	
15.	Mobility: Latencies, time mobile, mobile bouts, Sequences: Rotations, visit to zone in an order. Behaviors: Counts, durations, frequencies, sequence of zone entry,	
16.	System should be able to perform statistical analysis of the test and view results in text, graph or spread sheet formats, with up-gradation free of cost for life time.	
17.	System should have the capacity to add or delete animals and option to amend the experimental setup during experiment without disturbing the protocol setup.	
18.	It should have the ability to start (or end) the tests in all apparatus at the same time and can automatically generate track plotting & occupancy plotting (Heat map) of test & control subjects	
19.	The system should easily be connected and controlled to a variety of devices commonly used in behavior test like levers, photo-beam cells, pellet dispensers, shockers, lamps and speakers.	
20.	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.	
21.	27.Validity of Quotation:	Minimum 3 months.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Behaviour and Activity Test System **Quantity: 1 no.**

S.No.	Parameters Desired Specifications	Compliance Yes/No
(b) Specification for Open Field Animal Activity Meter The instrument should essentially have the following		
1.	Activity meter should be designed for the Open Field Anxiety and Exploratory Tests for 4 animals.	
2.	System should be using latest technology to quantify loco motor activity and trace the animal's path for behavioral analysis.	
3.	Systems can support up to 16 stations on a single PC.	
4.	System should have four cages, and sensors, brackets, interface, and Windows software.	
5.	System should have ability to record the interruption of beams along the horizontal axes (X, Y & Z) provide coordinates that identify animal location.	
6.	Software should be able to records these coordinates for later playback and analysis.	
7.	System can be adapted to perform automated measurements for other tests, such as the Contextual Place Preference Test, Hole Poke Exploratory Test, and Light/Dark Transition Test.	
8.	The system should record distance traveled, resting time, stereotypic time, ambulatory time, burst of stereotypic time, horizontal and ambulatory beam breaks, raw data storage (GLP compliant), validation protocols and Re analysis data.	
9.	The instrument should be complete in itself with all the essential attachments, UPS, PC/MAC compatible software, standard i5 laptop, etc. Any additional accessory, required for upgradation or optional attachment be quoted separately.	
10	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.	
11	**Comprehensive Maintenance Contract (CMC):** After the completion of 3 year OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
(b) Technical Specifications for Rotarod For Rat & Mice The system should have the following essentials,		
1.	Rotarod should be capable of testing up to four animals simultaneously for their ability to maintain themselves upright on a rotating rod.	
2.	There should be an option to select accelerating or constant speed mode of operation as well as a slow speed waiting mode before acceleration takes place.	

3.	Speed and acceleration rate should be programmable.	
4.	An animal fall should be detected by infrared photo-cells.	
5.	Software should allow programmed intervals for speed changes, even spinning direction, should be programmed into a specific protocol of the user's design.	
6.	It should allow monitoring of looping behavior; length of trial and number of loops.	
7.	Data should be generated in a CSV format that can be easily opened by most statistical analysis programs.	
8.	Number of Exercise Lanes should be 4.	
9.	Rotarod Spindle Speed Range should be 0 - 99.9 RPM	
10.	Acceleration Increments should be 0.1 RPM per second. to 20.0 RPM per second.	
11.	Animal's absence from rod assembly should be monitored by Scanning infrared beam diagnostic for GLP validation.	
12.	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.	
13.	**Comprehensive Maintenance Contract (CMC):** After the completion of 3 year OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
14.	The instrument should be complete in itself with all the essential attachments, UPS, PC/MAC compatible software, standard i5 laptop, etc. Any additional accessory, required for upgradation or optional attachment be quoted separately.	
15.	(32) sensors.	
16.	The software should have facility to record the passive rotation time, running duration, speed at the time of fall and distance travelled with facility for self-check and	
(c) Specifications for Grip Strength Meter The system should have the following essentials,		
1.	System should assess neuromuscular function by sensing the peak amount of force an animal applies in grasping specially designed pull bar assemblies.	
2.	System performance should be with precision force gauges in such a manner as to retain the peak force applied on a digital display, the values may be either recorded manually or sent to an attached computer via USB.	
3.	System should support Fore and hind limb assessments.	
4.	System readings must be obtained in pounds, kilograms, or newtons all values accurately within +/- 0.25% of full-scale capacity, force gauges are offered in 0-1Kg and 0-5Kg ranges.	
5.	System defines Objective assessment of neuromuscular performance specially designed pull bar assemblies, simple operation, selectable force units.	
6.	System should support standard pull bar assemblies are offered for rats and mice.	

7.	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.	
8.	**Comprehensive Maintenance Contract (CMC):** After the completion of 3 year OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
9.	The instrument should be complete in itself with all the essential attachments, UPS, PC/MAC compatible software, standard i5 laptop, etc. Any additional accessory, required for upgradation or optional attachment be quoted separately.	
(d) Technical Specification Multi-Configuration Behavior Video tracking and mazes with optogenetic studies complete system for small animal The system should have the following essential requirements,		
1.	Multi-configuration behavior tracking equipment for small animal is essential for study of different conditions, like anxiety, locomotors activity, depression, memory learning and stress response from small animal in experimental condition.	
2.	Multi-configuration behavior tracking system setup should consists of Open field enclosure, hole board insert, novel objects, light/dark box enclosure, conditioned place preference enclosure and mazes (Elevated plus maze, Radial Maze, T-Maze, Y-maze and Morris Water Maze for rat and mice.).	
3.	Multi-Configuration Behavior tracking equipment should be a completely automated system designed to make behavioral tracking convenient and affordable for a range of behavioral tests.	
4.	It should be a multiple tests system with a single base consists of behavior tracking Software, digital interface device, universal Base Plate with IR Photo beam Array, USB CMOS Camera and Camera Accessories including locally made camera stand.	
5.	Camera should be B&W USB 2.0 CMOS with separate lens vari-focal, 2.7-13.5mm and 15 ft USB 2.0 Male to Mini cable. A total of 06 cameras to be provided	
6.	IR photo beam array should provide a 'curtain' of photo beams and should be used to detect when an animal rears and also be as a movement detector for generation of reliable movement 'counts' in circumstances.	
7.	IR photo beam array should plugs directly into digital Interface device within 100 cm for rat, maximum working distance is 50cm separation with 12.5mm space between beams (across the array) and also with option for 40cm for mice	
8.	Tracking software should be flexible and can be used to track the behavior of rodent in any types of mazes with as many as sixteen pieces of camera.	
9.	It should include optogenetic interface with 4 channels, digital output etc.	
10.	The software should have the facility to create password protected individual id to comply with GLP and the save data should also be password protected.	
11.	It should support an array of cameras like USB digital cameras, fire wire	

	cameras, DV cam coder, and CCTV camera, or analog pre-recorded video.	
12.	It should have the ability to track animal head, center and tail and can make an orientation between these three.	
13.	It should have the facility for sequence setting to detect specific transitions of the animal with in the apparatus and also have the facility to identify specific location in the apparatus.	
14.	System should automatically score over hundred different parameters like total distance travelled, average speed, mobile, immobile time and number of episode, total active, inactive time and episodes, longest, shortest active & inactive episodes, no of line crossings, absolute turn angle, total distance travelled by animal's head, animal body clock wise and anti-clockwise rotation, visited zone list, number of rearing episode, grooming of the animal and Overall: distance, speed, direction, Zones: Latency to enter, time in, distance from.	
15.	Mobility: Latencies, time mobile, mobile bouts, Sequences: Rotations, visit to zone in an order. Behaviors: Counts, durations, frequencies, sequence of zone entry,	
16.	System should be able to perform statistical analysis of the test and view results in text, graph or spread sheet formats, with up-gradation free of cost for life time.	
17.	System should have the capacity to add or delete animals and option to amend the experimental setup during experiment without disturbing the protocol setup.	
18.	It should have the ability to start (or end) the tests in all apparatus at the same time and can automatically generate track plotting & occupancy plotting (Heat map) of test & control subjects	
19.	The system should easily be connected and controlled to a variety of devices commonly used in behavior test like levers, photo-beam cells, pellet dispensers, shockers, lamps and speakers.	
20.	**Warranty:** The instrument (name) including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be one on site, the manufacturer must confirm this in their quotation.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

5. Technical Specifications for Single Crystal X-Ray Difractometer System

S. No.	Items	Specifications
1	Mounting and Cooling Facility:	(a) Floor mounted system for dedicated use in a laboratory. b) The X-ray diffractometer system should overall be air-cooled without any need for external water chillers.
2	Sample and Detector Positioning System:	(a) The instrument should include a fully automated high precision 4-circle kappa goniometer with all axes and detector distance controlled through the system computer. (b) The sample to the detector distance should be variable over a range of at least 40-145mm or higher. It should have very high angular precision and high angular coverage of minimum 150 deg. 2 Theta. (c) The XRD system must be equipped with sample-detector distance detection system in real mode. The goniometer's sphere of confusion should be less than 7 microns and must not be greater than 20 microns even when the detector is at its farthest distance.
3.	X-ray Source:	(a) Single Cu Kα micro-focus X-ray source with provision for second Mo-Kα source to be upgraded later, pre-aligned, maintenance free and designed for continuous operation together with sealed micro focus X-ray generator with all essential and latest generation high performance optics as well as X-ray source (PhotonJet-Z,IμS 3.0 or better) for the computer controlled data collection of highest standards so that data can be collected by using the both molybdenum and copper radiation without the need for replacing the X-ray tube as well as without modifying the optics. The switching over from one radiation source to another should be user friendly, instantaneous and controlled through computer with fast interchange of system settings. (b) The X-ray source(s) must be completely air cooled to provide the highest stability in beam position and beam intensity. The micro-focus source should have good power output of 50 W or better, and the beam diameter at the crystal should be optimum through use of suitable pinholes / collimators. The X-ray source should comply with statutory safety regulations. Fully X-ray protected enclosure as per international safety norms. Manufacturer of the micro-focus source must be mentioned. The X-ray source should be covered by minimum 5 years replacement warranty from the date of installation.
4.	X-ray Detector:	(a) State-of-the-art detector suitable for both Mo and Cu radiation with highest sensitivity and latest technology. Detector should be based on Charge Integrating Pixel Array Detector (CPAD) / Hybrid Pixel Array(HPAD) /Hybrid Photon Counting(HPC) or better technology with no dead area for detecting the diffracted X-rays and accurately measuring their intensities from the diffraction pattern of single crystals. (b). The detector should be able to capture very weak as well as very strong reflections on a single frame with minimum global counts of at least 200,000 cps or better. The detector should have high signal to

		noise ratio with virtually noise free readout electronics and should be capable of shutter-less operation with auto air cooled facility. Vendor must specify the dark current and noise of the Detector Chip. Resolution of the detector should be 135 microns or better. The size of detector should be minimum 77 mm x 80 mm area or larger. Detector should carry a warranty of 5 years from the date of installation.
5.	Computer and Printer:	The Diffractometer Instrument should come with a PC with Factory loaded Software. Specifications of the PCs should be the following or better: Licensed Windows 10 operating system, Intel i5 CPU, 1.7 GHz or better, 8 GB RAM, 64bit Operating System, 1 TB HDD or better / higher. Intel Mother board, graphics card, 16X DVD RW. Latest LCD monitor > 22 inch. 2 TB external hard drive, colour laser Printer.
6	Application Software:	(a) The software suite provided with the system shall consist of a complete suite of well tested and user proven routines for the collection and integration of frame data on single crystals and for solving, refining, and displaying single crystal structures. (b) Software shall allow remote access to the instrument including diffractometer, goniometer, and X-ray generator functions to setup the experiment, view data as collected, process the data, solve and refine the structures remotely or off-line. (c) Software for auto structure solution, twins, low/high temperature, high pressure, charged density and modulated structure should be included. (d) An unlimited number of data integration and analysis software licenses should be available so that all local and remote dependents of the equipment should have the capability to analyze the data independently. (e) Manufacturer must offer their latest version of licensed software developed by them. No public domain software is acceptable. There must be an undertaking that updates to the instrument control/data collection and automated structure solution and refinement software will be provided as available free of charge and in perpetuity. (f) For data collection strategies, the software shall have predefined runs including Sphere, Hemisphere and Quadrant. Optimized runs shall provide for completeness / coverage as well as the facility for user defined runs. Software shall allow easy change of exposure time, scan ranges, scan width and detector distance and provide automatic re-measurement of overflow frames, automatic dark image acquisition and optional reference frames for tracking decaying samples. (g) The offered data acquisition software package must be compatible with SHELX, WINGX and OLEX2. (h). Software for Auto Structure solution should be quoted along with basic scope. (i) Most recent and advanced software for data analysis are required. Atleast 10 licenses within the campus for data analysis should be provided.

7.	Cooling Facility:	The X-ray diffractometer should be supplied with a sample cooling device that allows the control of the sample environment from 80-400K (Preferably Oxford 800 series) with an error not larger than ±0.1K over the whole temperature range. A liquid nitrogen storage tank for 150 or more litres with auto refill accessory and necessary valves, regulators, transfer line and other accessories should be included.
8.	Sample Temperature:	The sample temperature should be set and varied in a stepwise fashion by the instrument control software to allow for easily creating variable temperature measurements.
9.	Video Microscope & Illumination:	The system must include a colour video microscope which records colour images of the crystal mounted on the goniometer platform to assist alignment, monitoring, and face-absorption corrections. In addition, provision should be available to transfer and store images.
10.	Consumables:	Following Consumables should be supplied along with the system: i. Mounted cryo-loops of different sizes (0.1-0.2,0.2- 0.3, 0.3-0.4, 0.4-0.5, 0.5-0.6, 0.6 – 0.7 mm-25 each) for cryo-mounting. ii. Lindeman capillaries made of special glass with outer diameter of 0.2mm, 0.3mm, 0.5 mm -25 pcs of each type. iii. Five (5) Nos. of Goniometer head in the basic system. iv. Paraton N or equivalent Cryo mounting oil – 5 nos. v. Capillary Sealants: Duco Cement 29 ml x 5 nos. vi. Red sticky wax 2 box vii. Calibrating YLID Standard Crystal on Goniometer head – 1 no. viii. Super Glue 4 g tube- 5 nos. ix. Magnetic Base to mount on XYZ-Goniometer head. 49/64 mm – 10 no. x. MiTeGenmicromeshes 400/25- 10 no.
11.	UPS System:	A suitable Branded UPS for back up complete system and accessories including Low Temperature attachment for uninterrupted data collection for minimum one hour back-up should be quoted.
12	Microscope for Sample Selection	A stereo-zoom optical microscope with polarizer for crystal mounting.
13.	Manuals / Circuit-Diagrams and Instruction Sheets:	All the manuals and instruction sheets must be supplied in English for the purpose of service engineer's reference. The offered SCXRD system model should preferably comply with the latest machinery directive, for electrical equipment and electromagnetic compatibility under fully CE compliant guidelines (or equivalent).
14.	Spares:	One (1) No. of additional Mo X-ray micro focus tube, one (1) additional beam stopper and one (1) additional test crystal for calibration. Other spares as per standard practice should be provided. The detail list of spare to be enclosed with the offer for evaluation purpose. Supplier should confirm the availability of spares for next 10 years from the date of installation.
15.	Service Facility and Down-time Call Attendance:	Supplier should clearly mention about their service set up in India (preferably in Northern part of India for prompt service support. The manufacturer and/or their Indian representative must have at least three qualified and factory trained service engineer in India to be

		able to attend to service at Jiwaji University Gwalior within 48 hours on submitting a complaint. Training certificates from the manufacturer have to be provided with the tender. During the warranty period, only factory trained and certified engineers are acceptable to attend the service. In case the equipment/system remains non-operational for more than 5 days then warranty period will be extended for the equivalent period for which equipment/system remained non-operational. Warranty extension in such case shall be done without prejudice to any other term & condition of the contract. JU Gwalior would like to enter in service agreement through which JU Gwalior will receive replacement of defective spares/part (if any, that are not covered under warranty) immediately so as to minimize the down time. Order, if any, required to be placed for such spares/parts will be done by JU Gwalior in due course of time.
16.	Qualification Criteria of the Instrument:	The data collected in the offered XRD system must be publishable as per the Acta Crystallographica guideline. This is applicable for both Mo and Cu radiation.
17.	Pre-Installation Requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.
18.	Installation, Commissioning and Application Training:	Free of cost at site for 10 working days for a group of technical staff/students for operating the instrument to complete structure determination/solution. There will be minimum two basic pieces of training namely installation training and after few months advanced application training. Apart from these two, there will be application training every six months on mutually convenient dates. The application training must be provided by the application scientist having expertiseon the X-ray Crystallography.
19.	Warranty:	The single crystal X-ray diffractometer system including X-ray tube, detector, cryo-system, and UPS quoted for it should be under comprehensive warranty for five (5) years from the date of installation. Comprehensive warranty should explicitly include all spare parts and system consumable part i.e. valves washers, gaskets, anything which does not get consumed with sample preparation or running. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation
20.	Annual Maintenance Contract(AMC):	Annual maintenance contract for five (5) years effective soon after the expiry of the comprehensive warranty period (5 years) should be included in the offer.
21.	Installation in India	Detailed lists of users in India with contact details for the quoted models. Preferably, there should be at least one same quoted model installed/ordered in India in last 5 years. If required JU Gwalior team will visit the installation site.
22.	Performance	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
23.	Validity of Quotation:	Minimum 3 months.
24.	Submission of Bids:	Tender should be submitted in two parts – technical and financial

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Single Crystal X-ray Diffractometer System **Quantity: 1 no.**

S. No.	Items	Specifications	**Compliance Yes/No**
1	Mounting and Cooling Facility:	(a) Floor mounted system for dedicated use in a laboratory. b) The X-ray diffractometer system should overall be air-cooled without any need for external water chillers.	
2	Sample and Detector Positioning System:	(a) The instrument should include a fully automated high precision 4-circle kappa goniometer with all axes and detector distance controlled through the system computer. (b) The sample to the detector distance should be variable over a range of at least 40-145 mm or higher. It should have very high angular precision and high angular coverage of minimum 150 deg. 2 Theta. (c) The XRD system must be equipped with sample-detector distance detection system in real mode. The goniometer's sphere of confusion should be less than 7 microns and must not be greater than 20 microns even when the detector is at its farthest distance.	
3.	X-ray Source:	(a) Single Cu Kα micro-focus X-ray source with provision for second Mo-Kα source to be upgraded later, pre-aligned, maintenance free and designed for continuous operation together with sealed micro focus X-ray generator with all essential and latest generation high performance optics as well as X-ray source (PhotonJet-Z,IμS 3.0 or better) for the computer controlled data collection of highest standards so that data can be collected by using the both molybdenum and copper radiation without the need for replacing the X-ray tube as well as without modifying the optics. The switching over from one radiation source to another should be user friendly, instantaneous and controlled through computer with fast interchange of system settings. (b) The X-ray source(s) must be completely air cooled to provide the highest stability in beam position and beam intensity. The micro-focus source should have good power output of 50 W or better, and the beam diameter at the crystal should be optimum through use of suitable pinholes / collimators. The X-ray source should comply with statutory safety regulations. Fully X-ray protected enclosure as per international safety norms. Manufacturer of the micro-focus source must be mentioned. The X-ray source should be covered by minimum 5 years replacement warranty from the date of installation.	

4.	X-ray Detector:	(a) State-of-the-art detector suitable for both Mo and Cu radiation with highest sensitivity and latest technology. Detector should be based on Charge Integrating Pixel Array Detector (CPAD) / Hybrid Pixel Array(HPAD) /Hybrid Photon Counting(HPC) or better technology with no dead area for detecting the diffracted X-rays and accurately measuring their intensities from the diffraction pattern of single crystals. (b). The detector should be able to capture very weak as well as very strong reflections on a single frame with minimum global counts of at least 200,000 cps or better. The detector should have high signal to noise ratio with virtually noise free readout electronics and should be capable of shutter-less operation with auto air cooled facility. Vendor must specify the dark current and noise of the Detector Chip. Resolution of the detector should be 135 microns or better. The size of detector should be minimum 77 mm x 80 mm area or larger. Detector should carry a warranty of 5 years from the date of installation.	
5.	Computer and Printer:	The Diffractometer Instrument should come with a PC with Factory loaded Software. Specifications of the PCs should be the following or better: Licensed Windows 10 operating system, Intel i5 CPU, 1.7 GHz or better, 8 GB RAM, 64bit Operating System, 1 TB HDD or better / higher. Intel Mother board, graphics card, 16X DVD RW. Latest LCD monitor > 22 inch. 2 TB external hard drive, colour laser Printer.	
6	Application Software:	(a) The software suite provided with the system shall consist of a complete suite of well tested and user proven routines for the collection and integration of frame data on single crystals and for solving, refining, and displaying single crystal structures. (b) Software shall allow remote access to the instrument including diffractometer, goniometer, and X-ray generator functions to setup the experiment, view data as collected, process the data, solve and refine the structures remotely or off-line. (c) Software for auto structure solution, twins, low/high temperature, high pressure, charged density and modulated structure should be included. (d) An unlimited number of data integration and analysis software licenses should be available so that all local and remote dependents of the equipment should have the capability to analyse the data independently. (e) Manufacturer must offer their latest version of licensed software developed by them. No public domain software is acceptable. There must be an undertaking that updates to the instrument control/data collection and automated structure solution and refinement software will be provided	

		as available free of charge and in perpetuity. (f) For data collection strategies, the software shall have predefined runs including Sphere, Hemisphere and Quadrant. Optimized runs shall provide for completeness / coverage as well as the facility for user defined runs. Software shall allow easy change of exposure time, scan ranges, scan width and detector distance and provide automatic re-measurement of overflow frames, automatic dark image acquisition and optional reference frames for tracking decaying samples. (g) The offered data acquisition software package must be compatible with SHELX, WINGX and OLEX2. (h). Software for Auto Structure solution should be quoted along with basic scope. (i) Most recent and advanced software for data analysis are required. Atleast 10 licenses within the campus for data analysis should be provided.	
7.	Cooling Facility:	The X-ray diffractometer should be supplied with a sample cooling device that allows the control of the sample environment from 80-400K (Preferably Oxford 800 series) with an error not larger than ±0.1K over the whole temperature range. A liquid nitrogen storage tank for 150 or more litres with auto refill accessory and necessary valves, regulators, transfer line and other accessories should be included.	
8.	Sample Temperature:	The sample temperature should be set and varied in a stepwise fashion by the instrument control software to allow for easily creating variable temperature measurements.	
9.	Video Microscope & Illumination:	The system must include a colour video microscope which records colour images of the crystal mounted on the goniometer platform to assist alignment, monitoring, and face-absorption corrections. In addition, provision should be available to transfer and store images.	
10.	Consumables:	Following Consumables should be supplied along with the system: i. Mounted cryo-loops of different sizes (0.1-0.2,0.2- 0.3, 0.3-0.4, 0.4-0.5, 0.5-0.6, 0.6 – 0.7 mm-25 each) for cryo-mounting. ii. Lindeman capillaries made of special glass with outer diameter of 0.2mm, 0.3mm, 0.5 mm -25 pcs of each type. iii. Five (5) Nos. of Goniometer head in the basic system. iv. Paraton N or equivalent Cryo mounting oil – 5 nos. v. Capillary Sealants: Duco Cement 29 ml x 5 nos. vi. Red sticky wax 2 box vii. Calibrating YLID Standard Crystal on Goniometer head – 1 no.	

		viii. Super Glue 4 g tube- 5 nos. ix. Magnetic Base to mount on XYZ-Goniometer head. 49/64 mm – 10 no. x. MiTeGenmicromeshes 400/25- 10 no.	
11.	UPS System:	A suitable Branded UPS for back up complete system and accessories including Low Temperature attachment for uninterrupted data collection for minimum one hour back-up should be quoted.	
12	Microscope for Sample Selection	A stereo-zoom optical microscope with polarizer for crystal mounting.	
13.	Manuals / Circuit-Diagrams and Instruction Sheets:	All the manuals and instruction sheets must be supplied in English for the purpose of service engineer's reference. The offered SCXRD system model should preferably comply with the latest machinery directive, for electrical equipment and electromagnetic compatibility under fully CE compliant guidelines (or equivalent).	
14.	Spares:	One (1) No. of additional Mo X-ray micro focus tube, one (1) additional beam stopper and one (1) additional test crystal for calibration. Other spares as per standard practice should be provided. The detail list of spare to be enclosed with the offer for evaluation purpose. Supplier should confirm the availability of spares for next 10 years from the date of installation.	
15.	Service Facility and Down-time Call Attendance:	Supplier should clearly mention about their service set up in India (preferably in Northern part of India for prompt service support. The manufacturer and/or their Indian representative must have at least three qualified and factory trained service engineer in India to be able to attend to service at Jiwaji University Gwalior within 48 hours on submitting a complaint. Training certificates from the manufacturer have to be provided with the tender. During the warranty period, only factory trained and certified engineers are acceptable to attend the service. In case the equipment/system remains non-operational for more than 5 days then warranty period will be extended for the equivalent period for which equipment/system remained non-operational. Warranty extension in such case shall be done without prejudice to any other term & condition of the contract. JU Gwalior would like to enter in service agreement through which JU Gwalior will receive replacement of defective spares/part (if any, that are not covered under warranty) immediately so as to minimize the down time. Order, if any, required to be placed for such spares/parts will be done by JU Gwalior in due course of time.	
16.	Qualification Criteria of the Instrument:	The data collected in the offered XRD system must be publishable as per the Acta Crystallographica guideline. This is applicable for both Mo and Cu radiation.	

17.	Pre-Installation Requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.	
18.	Installation, Commissioning and Application Training:	Free of cost at site for 10 working days for a group of technical staff/students for operating the instrument to complete structure determination/solution. There will be minimum two basic pieces of training namely installation training and after few months advanced application training. Apart from these two, there will be application training every six months on mutually convenient dates. The application training must be provided by the application scientist having expertise on the X-ray Crystallography.	
19.	Warranty:	The single crystal X-ray diffractometer system including X-ray tube, detector, cryo-system, and UPS quoted for it should be under on site comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part i.e. valves washers, gaskets, anything which does not get consumed with sample preparation or running. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation	
20.	Comprehensive Maintenance Contract(CMC):	An extended comprehensive maintenance contract for two (2) years effective soon after the expiry of the comprehensive warranty period (3 years) should be included in the offer. Failing which the tender will be rejected.	
21.	Installation in India	Detailed lists of users in India with contact details for the quoted equipment must be provided. Preferably, there should be at least one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered. If required JU Gwalior team will visit the installation site.	
22.	Performance	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
23.	Validity of Quotation:	Minimum 3 months.	
24.	Submission of Bids:	Tender should be submitted in two parts – technical and financial	

I have enclosed all relevant documents in support of my claims (as above) in the following pages.

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

6. Technical Specification for Atomic Absorption Spectrophotometer

Sr. No.	Specification	Description
1.	Optics	Double Beam- With Flame and Furnace (Integrated System)
2.	Wavelength Range	185-900nm
3.	Detector	Photomultiplier tube (It Should be Wide PMT To Cover Complete Range 185-900nm)
4.	Back ground Correction	It should be Two background Correction D2 with SR Or Zeeman Background Correction
5.	Spectral Bandwidth	Variable from 0.1 to 2 nm in 6 Steps
6.	No Of HC Lamps	Minimum 8 Lamps Turret or more with 2 lamps simultaneously lit .
7.	Base Line Correction	Automatic Correction Of Baseline drift by offset correction in peak height and peak are mode.
8.	Focal Length	300 nm or better.
9.	Monochromator and Grating Lines	Czerny Turner Monochromator with 1800 lines/mm
10.	Flame Type	Air Cooled pre mix type or better.
11.	Burner Unit	Titanium 10cm slot and 5 cm titanium slot for N_2O-C_2H_2
12.	Nebulizer	Pt-Ir capillary with teflon orifice and ceramic impact bead
13.	Sensitivity	Detection limit for Cu ‹0.006 ppm. ≥0.90 Absorbance with % RSD of ≤0.5% from ten replication (5 sec integration time) of 5 ppm in standard.
14.	Chamber	Polypropylene type
15.	Gas control unit	Fuel: automatic search for optimum flow rate, Automatic search of optimum gas flow rate
16.	Safety features	Automatic gas leak check · Automatic switching between Air-C_2H_2 and N_2O-C_2H_2 · Flame monitor · Prevention of wrong burner head use · Gas pressure monitor · Drain tank level monitor · Automatic flame extinction upon power outage or sudden power interruption
17.	Software	Software based AA, Should have QA/QC Function or similar functions
18.	HVG (Hydried Vapor Generator for As,Se,Sb,Te,Bi.)	Should be attached
19.	Analysis System	Continuous flow system
20.	Sample consumption	Variable
21.	Reagent consumption	Variable
22.	Atomizer	Heated absorption cell, standard system should uses air-C_2H_2 flame
23.	Operation through	Auto Sampler.
24.	Auto Sampler	Auto Sampler should be quoted with min 60 or more vial capacity or more and auto sampler should be capable to use for both flame and furnace.
25.	Graphite Furnace	Graphite furnace should be included with temp range up to 2800 degree or more with position lateral/ vertical manual adjustment
26.	Accessories	C_2H_2 Cylinder with regulator, Nitrous Oxide Cylinder with regulator & Pre-heater. Argon Cylinder with Regulator, Air Compressor , Fume Hood, Chiller for Furnace, Suitable branded Windows 10 PC with laser jet printer. The MS office will be original package to be included, Lamps and individual standards solution (1000 ppm) for Zn, Mn, Ni, Fe, Cu, Pb, Al, Mo, Cd, B, Cr,

		Co, As, Hg, Se. (Total 15 lamps and standards)
27.	UPS	5.0 KVA or more Online UPS branded with at least 30 minutes back up to be quoted separately with offer
28.	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.
29.	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument.
30.	Warranty:	The instrument Atomic Absorption Spectrophotometer including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
31.	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
32.	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
33.	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
34.	Validity of Quotation:	Minimum 3 months.
35.	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Atomic Absorption Spectrophotometer

Quantity: 1 no.

S. No.	Specification	Description	Compliance Yes/No
1.	Optics	Double Beam- With Flame and Furnace (Integrated System)	
2.	Wavelength Range	185-900nm	
3.	Detector	Photomultiplier tube (It Should be Wide PMT To Cover Complete Range 185-900nm)	
4.	Back ground Correction	It should be Two background Correction D2 with SR Or Zeeman Background Correction	
5.	Spectral Bandwidth	Variable from 0.1 to 2 nm in 6 Steps	
6.	No Of HC Lamps	Minimum 8 Lamps Turret or more with 2 lamps simultaneously lit .	
7.	Base Line Correction	Automatic Correction Of Baseline drift by offset correction in peak height and peak are mode.	
8.	Focal Length	300 nm or better.	
9.	Monochromator and Grating Lines	Czerny Turner Monochromator with 1800 lines/mm	
10.	Flame Type	Air Cooled pre mix type or better.	
11.	Burner Unit	Titanium 10cm slot and 5 cm titanium slot for N_2O-C_2H_2	
12.	Nebulizer	Pt-Ir capillary with teflon orifice and ceramic impact bead	
13.	Sensitivity	Detection limit for Cu ‹0.006 ppm. ≥0.90 Absorbance with % RSD of ≤0.5% from ten replication (5 sec integration time) of 5 ppm in standard.	
14.	Chamber	Polypropylene type	
15.	Gas control unit	Fuel: automatic search for optimum flow rate, Automatic search of optimum gas flow rate	
16.	Safety features	Automatic gas leak check · Automatic switching between Air-C_2H_2 and N_2O-C_2H_2 · Flame monitor · Prevention of wrong burner head use · Gas pressure monitor · Drain tank level monitor · Automatic flame extinction upon power outage or sudden power interruption	
17.	Software	Software based AA, Should have QA/QC Function or similar functions	
18.	HVG (Hydried Vapor Generator for As,Se,Sb,Te,Bi.)	Should be attached	
19.	Analysis System	Continuous flow system	
20.	Sample consumption	Variable	
21.	Reagent consumption	Variable	
22.	Atomizer	Heated absorption cell, standard system should uses air-C_2H_2	

		flame	
23.	Operation through	Auto Sampler.	
24.	Auto Sampler	Auto Sampler should be quoted with min 60 or more vial capacity or more and auto sampler should be capable to use for both flame and furnace.	
25.	Graphite Furnace	Graphite furnace should be included with temp range up to 2800 degree or more with position lateral/ vertical manual adjustment	
26.	Accessories	C_2H_2 Cylinder with regulator, Nitrous Oxide Cylinder with regulator & Pre-heater. Argon Cylinder with Regulator, Air Compressor , Fume Hood, Chiller for Furnace, Suitable branded Windows 10 PC with laser jet printer. The MS office will be original package to be included, Lamps and individual standards solution (1000 ppm) for Zn, Mn, Ni, Fe, Cu, Pb, Al, Mo, Cd, B, Cr, Co, As, Hg, Se. (Total 15 lamps and standards)	
27.	UPS	5.0 KVA or more Online UPS branded with at least 30 minutes back up to be quoted separately with offer	
28.	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.	
29.	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument.	
30.	Warranty:	The instrument Atomic Absorption Spectrophotometer including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
31.	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
32.	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
33.	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
34.	Validity of Quotation:	Minimum 3 months.	
35.	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

7. Technical Specification for Aerosol Mass Monitor

Sr. No.	Specification and Description
1.	High precision pump-suction sensor.
2.	Laser Mie-scattering Principle.
3.	Working temperature ranges between 0-50^{0}C
4.	Storage Temperature Range; -20^{0}C to 60^{0}C
5.	High stability air pump imported
6.	User-defined five-channel particle size options
7.	Built-in temperature and humidity sensor
8.	TFT LCD large display with intuitive data
9.	Measuring Range 0-1000µg/m^3
10.	Resolution: 0.1µg/m^3
11.	Accuracy: ±10%
12.	Sampling Rate: 10s
13.	Laser emitter: 40mW, 780nm
14.	Point source location monitoring, fugitive emission monitoring.
15.	Hand held operation
16.	Five Mass Ranges (PM1.PM2.5, PM4, PM10 &TSP
17.	Rechargeable: Battery Charger/Adapter operated
18.	Data Storage: 2500 records
19.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.
20.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.
21.	Warranty: The instrument Aerosol Mass Monitor including 3.5 KVA UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
22.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
23.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
24.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
25.	Validity of Quotation: Minimum 3 months.
26.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Aerosol Mass Monitor

Quantity: 1 no.

S. No.	Specification and Description	Compliance Yes/No
1.	High precision pump-suction sensor.	
2.	Laser Mie-scattering Principle.	
3.	Working temperature ranges between 0-50^{0}C	
4.	Storage Temperature Range; -20^{0}C to 60^{0}C	
5.	High stability air pump imported	
6.	User-defined five-channel particle size options	
7.	Built-in temperature and humidity sensor	
8.	TFT LCD large display with intuitive data	
9.	Measuring Range 0-1000µg/m^3	
10.	Resolution: 0.1µg/m^3	
11.	Accuracy: ±10%	
12.	Sampling Rate: 10s	
13.	Laser emitter: 40mW, 780nm	
14.	Point source location monitoring, fugitive emission monitoring.	
15.	Hand held operation	
16.	Five Mass Ranges (PM1.PM2.5, PM4, PM10 &TSP	
17.	Rechargeable: Battery Charger/Adapter operated	
18.	Data Storage: 2500 records	
19.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.	
20.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.	
21.	Warranty: The instrument Aerosol Mass Monitor including 3.5 KVA UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer	

	must confirm this in their quotation.	
22.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
23.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
24.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
25.	Validity of Quotation: Minimum 3 months.	
26.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

8. Technical Specification for Automated Nucleic Acid Extraction System

Sr. No.	Specification and Description
1.	An automatic system for extraction of contamination-free DNA & RNA from a range of sample types, Such as Bacterial Cells, Plant Tissue, Fungi/Yeast & Total Viral Nucleic Acid using magnetic bead based chemistry.
2.	System should be of a small footprint.
3.	System should use cartridges Pre-Filled with reagents and paramagnetic particles
4.	System should work in stand-alone mode and/or Tablet / PC controlled mode
5.	System should be capable of processing 16 or more samples in per run.
6.	System should not use tips and liquid suction. Instrument should not involve any liquid transfer step to avoid sample cross contaminations.
7.	Elution should be heated with provision of 30-100 µl or better.
8.	Extracted Nucleic acid should be of high purity and should be compatible with wide range of downstream applications such as Sanger and Next Generation Sequencing (NGS), arrays and digital PCR.
9.	The instrument should come along with quantitation platform for nucleic acid quantitation necessary after isolation of DNA /RNA. Quantitation system should be sensitive enough to detect 10 pg /µl of DNA &100pg/µl RNA .
10.	Should have in-built UV sterilization.
11.	Should offer pre-programmed methods for the kits for various sample types.
12.	Should have LCD/tablet display panel.
13.	Should have minimum 5 installation in India. Enclose the user list.
14.	Quote the kits price (Per sample cost)
15.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.
16.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.
17.	Warranty: The instrument Automated Nucleic Acid Extraction System including 2KVA UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
18.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
19.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
20.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
21.	Validity of Quotation: Minimum 3 months.
22.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Automated Nucleic Acid Extraction System

Quantity: 1 no.

S. No.	Specification Description	Compliance Yes/No
1.	An automatic system for extraction of contamination-free DNA & RNA from a range of sample types, Such as Bacterial Cells, Plant Tissue, Fungi/Yeast & Total Viral Nucleic Acid using magnetic bead based chemistry.	
2.	System should be of a small footprint.	
3.	System should use cartridges Pre-Filled with reagents and paramagnetic particles	
4.	System should work in stand-alone mode and/or Tablet / PC controlled mode	
5.	System should be capable of processing 16 or more samples in per run.	
6.	System should not use tips and liquid suction. Instrument should not involve any liquid transfer step to avoid sample cross contaminations.	
7.	Elution should be heated with provision of 30-100 µl or better.	
8.	Extracted Nucleic acid should be of high purity and should be compatible with wide range of downstream applications such as Sanger and Next Generation Sequencing (NGS), arrays and digital PCR.	
9.	The instrument should come along with quantitation platform for nucleic acid quantitation necessary after isolation of DNA /RNA. Quantitation system should be sensitive enough to detect 10 pg /µl of DNA &100pg/µl RNA .	
10.	Should have in-built UV sterilization.	
11.	Should offer pre-programmed methods for the kits for various sample types.	
12.	Should have LCD/tablet display panel.	
13.	Should have minimum 5 installation in India. Enclose the user list.	
14.	Quote the kits price (Per sample cost)	
15.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.	
16.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.	
17.	Warranty: The instrument Automated Nucleic Acid Extraction System including 2KVA UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work	

	or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
18.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
19.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
20.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
21.	Validity of Quotation: Minimum 3 months.	
22.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

9. Technical Specification for CHN Analyzer

Sr. No.	Specification and Description
1.	Should be Compact analyzer for the determination of C / H / N in both solid and liquid samples.
2.	Analysis time: should not be more than 10 minutes.
3.	It should be fully automated having facility of automated transfer of the sample.
4.	It should be auto sampler (Range 50-150 samples).
5.	Determination of CHN should be in a single run with accuracy and precision.
6.	Automated evaluation of C/N and C/H ratio
7.	Analyze from few ppm to 100%.
8.	Sample weight: up to 1000 mg of the sample
9.	System should include Software which can store data and handle for statistical analysis and report generation.
10.	Measuring range: carbon from 0.001to 3 mg or better
11.	Measuring range: Hydrogen from 0.001 to 1.0 mg. or better
12.	Measuring range: Nitrogen: 0.001 to 6.0 mg. or better
13.	Temperature range 100-1100 Degree Celsius
14.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.
15.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.
16.	Warranty: The instrument CHN Analyzer including UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
17.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
18.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
19.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
20.	Validity of Quotation: Minimum 3 months.
21.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

CHN Analyzer **Quantity: 1 no.**

Sr. No.	Specification and Description	Compliance Yes/No
1.	Should be Compact analyzer for the determination of C / H / N in both solid and liquid samples.	
2.	Analysis time: should not be more than 10 minutes.	
3.	It should be fully automated having facility of automated transfer of the sample.	
4.	It should be auto sampler (Range 50-150 samples).	
5.	Determination of CHN should be in a single run with accuracy and precision.	
6.	Automated evaluation of C/N and C/H ratio	
7.	Analyze from few ppm to 100%.	
8.	Sample weight: up to 1000 mg of the sample	
9.	System should include Software which can store data and handle for statistical analysis and report generation.	
10.	Measuring range: carbon from 0.001to 3 mg or better	
11.	Measuring range: Hydrogen from 0.001 to 1.0 mg. or better	
12.	Measuring range: Nitrogen: 0.001 to 6.0 mg. or better	
13.	Temperature range 100-1100 Degree Celsius	
14.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.	
15.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.	
16.	Warranty: The instrument CHN Analyzer including UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
17.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
18.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted	

	equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
19.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
20.	Validity of Quotation: Minimum 3 months.	
21.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

10. Technical Specification for Gas Chromatograph Mass Spectrometer (GCMS)

Sr. No.	Specification	Description
1.	Column Oven :	Large column oven (>13.5 litre) up to 450 ^{o}C from room temp to + 3 ^{o}C with a temperature programming up to 30 steps or higher and rate setting range up to -125 ^{o}C /min with a total time for all steps up to 9999.99 minutes max and oven cool down time from 450C to 50C in 4.0 minutes or less.
2.	Injection Port:	Two Capillary Injection port up to 400 ^{o}C or more with Electronic Control and AFC pressure range should upto 970 kPa or 145 psi. The Same injection port should be able to connect upto 0.53 Capillary column directly. The Electronic Flow control should be able to program for Pressure /flow minimum 7 step with a split ratio setting up to 9999.9:1. System should be upgradable to 2 injector ports simultaneously.
		FID Detector sensitivity should be 1.2 -1.4 pg/C , G C should be upgradable to 2- 4 detectors simultaneously.
		Liquid Auto Injector of Minimum 100-150 Vials should be included.
3.	Mass Spectrometer :	Quadruple Mass Analyzer with Range up to 1.2 to 100 amu with scanning speed of 20,000 amu/sec , maximum scan cycle should be 100. Number of temperature Zone should be 8 GCMS should have a TMP pump must be more than 300 L and Rotary pump. Filament should be dual and automatic switchover and possible Dynamic Range should be >109 or more.
		Retention time should be highly precise for correction over the entire chromatogram, and analytical conditions are not changed, so the SOP does not need to be changed.
		Starting/stopping the system fully automatically from the computer.
		Software should allow flagging with two criteria on both the upper and lower ends, and displays a list of quantitative results and chromatograms for all components and all samples. Detailed verification and correction for each component also should be possible. Reports can be output as summary reports.
		SIM channel should take up to 64 x 128 Channel Ion source can be independently heat up to 200 deg and energy can be varied up to 200 eV.
		GCMS Should be quoted with Simultaneous SCAN & SIM mode GCMS should be with EI Scan sensitivity 1 Pg for OFN at S/N >= 1500 RMS and with a Licensed version only.
4.	Data Processor – Software and utilities	Latest 32 bit software of the Creation of automatic SIM Table, Automatic adjustment of Retention time, Similarity Search, with retention index . GCMS instrument tuning should be automatic. Latest licensed NIST 2020 library should be offered along with the instrument.
		PC based latest version GC with Large LCD Display with touch screen to view Real time Chromatogram on the LCD and built in GC System check and self-diagnostic function with following specification GCMS should be upgradable for online connection with reactor with a automated valve connection .
		GCMS Should be supplied with all installation accessories required like branded PC, Printer , He, H_2,N_2, Air cylinder with regulator- 1 no Each, gas purification panel with necessary accessories , one capillary column, Liquid Syringe.
		Following consumables to be offered with the quotation: Graphite and Vespel Ferrules (10 each), Silica wool, Septum (50 pcs), Filament (02 pcs) Split and Splitless liner (05 each) Nuts (10 pcs), O-Ring (10 pcs), 1.5 ml vials with caps and septa (200 no's), Gas Filter Kit, Split Filter. Tool Kit.

5.	UPS	Online 7.50 KVA or more UPS branded with at least 30 minutes back up to be quoted separately with offer
6.	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.
7.	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument. On-site Training should be provided twice in a year up to warranty period of 3 years.
8.	Warranty:	The instrument GCMS including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
9.	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
10.	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
11.	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
12.	Validity of Quotation:	Minimum 3 months.
13.	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Gas Chromatograph Mass Spectrometer (GCMS) **Quantity: 1 no.**

Sr. No.		Specification and Description	Compliance Yes/No
1.	Column Oven :	Large column oven (>13.5 litre) up to 450 ^{o}C from room temp to + 3 ^{o}C with a temperature programming up to 30 steps or higher and rate setting range up to -125 ^{o}C /min with a total time for all steps up to 9999.99 minutes max and oven cool down time from 450C to 50C in 4.0 minutes or less.	
2.	Injection Port:	Two Capillary Injection port up to 400 ^{o}C or more with Electronic Control and AFC pressure range should upto 970 kPa or 145 psi. The Same injection port should be able to connect upto 0.53 Capillary column directly. The Electronic Flow control should be able to program for Pressure /flow minimum 7 step with a split ratio setting up to 9999.9:1. System should be upgradable to 2 injector ports simultaneously.	
		FID Detector sensitivity should be 1.2 -1.4 pg/C , G C should be upgradable to 2- 4 detectors simultaneously.	
		Liquid Auto Injector of Minimum 100-150 Vials should be included.	
3.	Mass Spectrometer :	Quadruple Mass Analyzer with Range up to 1.2 to 100 amu with scanning speed of 20,000 amu/sec , maximum scan cycle should be 100. Number of temperature Zone should be 8 GCMS should have a TMP pump must be more than 300 L and Rotary pump. Filament should be dual and automatic switchover and possible Dynamic Range should be >109 or more.	
		Retention time should be highly precise for correction over the entire chromatogram, and analytical conditions are not changed, so the SOP does not need to be changed.	
		Starting/stopping the system fully automatically from the computer.	
		Software should allow flagging with two criteria on both the upper and lower ends, and displays a list of quantitative results and chromatograms for all components and all samples. Detailed verification and correction for each component also should be possible. Reports can be output as summary reports.	
		SIM channel should take up to 64 x 128 Channel Ion source can be independently heat up to 200 deg and energy can be varied up to 200 eV.	
		GCMS Should be quoted with Simultaneous SCAN & SIM mode GCMS should be with EI Scan sensitivity 1 Pg for OFN at S/N >= 1500 RMS and with a Licensed version only.	
4.	Data Processor – Software and utilities	Latest 32 bit software of the Creation of automatic SIM Table, Automatic adjustment of Retention time, Similarity Search, with retention index . GCMS instrument tuning should be automatic. Latest licensed NIST 2020 library should be offered along with the instrument.	
		PC based latest version GC with Large LCD Display with touch screen to view Real time Chromatogram on the LCD and built in GC System check and self-diagnostic function with following specification GCMS should be upgradable for online connection with	

		reactor with a automated valve connection .	
		GCMS Should be supplied with all installation accessories required like branded PC, Printer , He, H_2,N_2, Air cylinder with regulator- 1 no Each, gas purification panel with necessary accessories , one capillary column, Liquid Syringe.	
		Following consumables to be offered with the quotation: Graphite and Vespel Ferrules (10 each), Silica wool, Septum (50 pcs), Filament (02 pcs) Split and Splitless liner (05 each) Nuts (10 pcs), O-Ring (10 pcs), 1.5 ml vials with caps and septa (200 no's), Gas Filter Kit, Split Filter. Tool Kit.	
5.	UPS	Online 7.50 KVA or more UPS branded with at least 30 minutes back up to be quoted separately with offer	
6.	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.	
7.	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument. On-site Training should be provided twice in a year up to warranty period of 3 years.	
8.	Warranty:	The instrument GCMS including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
9.	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
10.	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
11.	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
12.	Validity of Quotation:	Minimum 3 months.	
13.	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

11. Technical Specification for Gel Doc System

Sr. No.	Specification and Description
1.	System should have Image resolution of >4 mega pixels or more for resolving closely spaced bands on a gel.
2.	System should have pixel size of 4.65x4.65µm and Pixel Density (grey levels) of at least 4096 or more.
3.	System should have dynamic range of >3.0 orders of magnitude
4.	Imaging system should have Automatic capabilities with Application driven, user selected or recalled by a protocol.
5.	Should have 100 % repeatability via recallable protocols.
6.	System should have pre-calibrated focus for any zoom settings & sample height.
7.	Should have appropriate flat fielding correction automatically & consistently applied to image data for every application.
8.	Versatile system to support wide range of applications like- Fluorescent dye like Sybr green, Sybr safe, 2-D, 1-D, Dot Blotting, Nucleic acid detection , Quantization etc.
9.	System Should have Excitation source - Epi-white light and trans-UV are standard (wave length 302 nm included) (optional 254 nm and 365 nm lamp available); optional trans-white conversion screen and UV/blue conversion screen available
10.	System should have three illumination control modes, trans-UV, trans-white, epi-white
11.	System should be capable for imaging protein gels without staining and One pack of 10% fast running stain free gel solution sufficient to cast as many as 50 gels of 1.00 mm thickness should be provided to support stain free imaging.
12,.	Should have true 12 bit CCD camera.
13.	System can take max. Sample size 28 X 36 cm and maximum imaging Area 19.4 X26 cm.
14.	System should come with white light conversion screen.
15.	Should have motorized zoom lens- f/1.2, 12-75mm with numerical feedback value to reduce the experimental variation -Capable of Optimizing, saving, and quickly recalling the imaging acquisition settings
16.	Safe DNA Imaging without UV exposure- using the Blue Conversion screen to prevent damage from UV and preserve samples for downstream protein production.
17.	Reproducibly position or center the sample on the image platen by using gel alignment templates.
18.	Should come with 1 D analysis software with following features • Single mouse click from image capture to results and reports, very fast and efficient. • Should have comprehensive automated quantitative analysis of proteins & DNA samples in seconds. • Intuitive and well organized (efficient) selection of workflows based on applications • 3D viewer, Absolute and Relative quantitation • Should calculate precisely continuous focus curves that are consistently and automatically applied for every zoom position and sample height. No user intervention for focusing. All calculations are done at setup, once and for all image captures • Software should be multi user for multiple PC for use of multiple users and license free with lifetime free upgrades. • Auto exposure – 2 user defined modes (intense or faint bands) • Software should be single for imaging and analysis.

19.	Optional: ➢ A compatible branded PC Minimum i3,4GB Ram, 500 GB HDD,19inches falt color monitor, Windows 10 professional ➢ 1.0 kva Online UPS with 15 minutes back-up to be provided with the machine
20.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.
21.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.
22.	Warranty: The instrument Gel Doc System including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
23.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
24.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
25.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
26.	Validity of Quotation: Minimum 3 months.
27.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Gel Doc System

Quantity: 1 no.

Sr. No.	Specification and Description	Compliance Yes/No
1.	System should have Image resolution of >4 mega pixels or more for resolving closely spaced bands on a gel.	
2.	System should have pixel size of 4.65x4.65µm and Pixel Density (grey levels) of at least 4096 or more.	
3.	System should have dynamic range of >3.0 orders of magnitude	
4.	Imaging system should have Automatic capabilities with Application driven, user selected or recalled by a protocol.	
5.	Should have 100 % repeatability via recallable protocols.	
6.	System should have pre-calibrated focus for any zoom settings & sample height.	
7.	Should have appropriate flat fielding correction automatically & consistently applied to image data for every application.	
8.	Versatile system to support wide range of applications like- Fluorescent dye like Sybr green, Sybr safe, 2-D, 1-D, Dot Blotting, Nucleic acid detection , Quantization etc.	
9.	System Should have Excitation source - Epi-white light and trans-UV are standard (wave length 302 nm included) (optional 254 nm and 365 nm lamp available); optional trans-white conversion screen and UV/blue conversion screen available	
10.	System should have three illumination control modes, trans-UV, trans-white, epi-white	
11.	System should be capable for imaging protein gels without staining and One pack of 10% fast running stain free gel solution sufficient to cast as many as 50 gels of 1.00 mm thickness should be provided to support stain free imaging.	
12.	Should have true 12 bit CCD camera.	
13.	System can take max. Sample size 28 X 36 cm and maximum imaging Area 19.4 X26 cm.	
14.	System should come with white light conversion screen.	
15.	Should have motorized zoom lens- f/1.2, 12-75mm with numerical feedback value to reduce the experimental variation -Capable of Optimizing, saving, and quickly recalling the imaging acquisition settings	
16.	Safe DNA Imaging without UV exposure- using the Blue Conversion screen to prevent damage from UV and preserve samples for downstream protein production.	
17.	Reproducibly position or center the sample on the image platen by using gel alignment templates.	
18.	Should come with 1 D analysis software with following features • Single mouse click from image capture to results and reports, very fast and efficient. • Should have comprehensive automated quantitative analysis of proteins	

	& DNA samples in seconds. • Intuitive and well organized (efficient) selection of workflows based on applications • 3D viewer, Absolute and Relative quantitation • Should calculate precisely continuous focus curves that are consistently and automatically applied for every zoom position and sample height. No user intervention for focusing. All calculations are done at setup, once and for all image captures • Software should be multi user for multiple PC for use of multiple users and license free with lifetime free upgrades. • Auto exposure – 2 user defined modes (intense or faint bands) • Software should be single for imaging and analysis.	
19.	Optional: ➢ A compatible branded PC Minimum i3,4GB Ram, 500 GB HDD,19inches falt color monitor, Windows 10 professional ➢ 1.0 kva Online UPS with 15 minutes back-up to be provided with the machine	
20.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.	
21.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.	
22.	Warranty: The instrument Gel Doc System including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
23.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
24.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
25.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
26.	Validity of Quotation: Minimum 3 months.	
27.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

12. Technical Specifications for Lab Fermenter

S No	Specification	Description
1.	**Total Capacity**	**3 Liters (Three Liters)**
2.	**Working Volume**	**1.0 to 2.25 Liters**
3.	Type	Whole Glass/ double jacketed vessel Table Top, Autoclavable type with SS 316L Flange.
4.	Controls	Micro controller/ PLC/TFT based Auto Temperature/ RPM/ pH/ $DO_{2/}$ Antifoam/ Air Flow etc
5.	Display	Minimum 5.7" Graphic TFT Display for microprocessor based systems and 7"/10" HMI Display for PLC based systems.
6.	Top Flange/Head Plate	Ports for pH/DO_2 and temp/heater/Sample Ports of 19mm, feed/ inoculation ports etc.
7.	Condenser	Heat exchanger fitted on the top of the flange with 0.22 micron PTFE filter for out gas and air filtration. Water inlet and out let for circulation of cold water to maintain the reaction volume.
8.	Aeration	Through Glass Metered needle valve Rota meter with ring type air Sparger with inbuilt/ external air pump/ compressor.
9.	Inlet/Exhaust Filters	0.22 micron hydrophobic PTFE filters from 50 mm dia to 2" capsule filters
10.	Drive	Top driven direct/ magnetic coupled motor having 20 to 1400 RPM for Microbial Fermentation mode and 20 to 500 RPM for Cell culture Applications
11.	Impellers	Removable type impeller with Six/ Four SS316L blades for Microbial applications or Marine type impellers for Cell Culture Applications and other on demand basis
12.	Baffles	Removable Type Two/ Four number Baffles provided in Microbial Culture vessels.
13.	Agitation	Variable speed control and Display on HMI/TFT.
14.	Peristaltic Pumps	One fixed speed peristaltic pump fitted on the control panel for the addition of feed or substrate,two fixed speed peristaltic pumps for Acid/Base dosing or additional pumps on demand basis.
15.	Heating	Inbuilt Electric heating element fixed / incapsulated in a tube on the top of flange/ heating blanket.
16.	Temperature control	PID control through microprocessor with TFT display / PLC with HMI having control accuracy of +0.2 Deg. C.
17.	Software	Data Acquisition/ Software with RS 232C Serial communication/USB Interface to PC for trends/graphs and tabular form DATA AQUISITION with inbuilt memory for data storage.
18	Power Supply	230V+ 10%,AC,50 Hz.
19	UPS	2.0 KVA or more UPS branded with at least 30 minutes back up to be quoted separately with offer
20	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.
21	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument.

22	Warranty:	The instrument Lab Fermenter including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
23	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
24	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
25	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
26	Validity of Quotation:	Minimum 3 months.
27	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Lab Fermenter

Quantity: 1 no.

Sr. No.	Specification	Description	Compliance Yes/No
1.	**Total Capacity**	**3 Liters (Three Liters)**	
2.	**Working Volume**	**1.0 to 2.25 Liters**	
3.	Type	Whole Glass/ double jacketed vessel Table Top, Autoclavable type with SS 316L Flange.	
4.	Controls	Micro controller/ PLC/TFT based Auto Temperature/ RPM/ pH/ $DO_{2/}$ Antifoam/ Air Flow etc	
5.	Display	Minimum 5.7" Graphic TFT Display for microprocessor based systems and 7"/10" HMI Display for PLC based systems.	
6.	Top Flange/Head Plate	Ports for pH/DO_2 and temp/heater/Sample Ports of 19mm, feed/ inoculation ports etc.	
7.	Condenser	Heat exchanger fitted on the top of the flange with 0.22 micron PTFE filter for out gas and air filtration. Water inlet and out let for circulation of cold water to maintain the reaction volume.	
8.	Aeration	Through Glass Metered needle valve Rota meter with ring type air Sparger with inbuilt/ external air pump/ compressor.	
9.	Inlet/Exhaust Filters	0.22 micron hydrophobic PTFE filters from 50 mm dia to 2" capsule filters	
10.	Drive	Top driven direct/ magnetic coupled motor having 20 to 1400 RPM for Microbial Fermentation mode and 20 to 500 RPM for Cell culture Applications	
11.	Impellers	Removable type impeller with Six/ Four SS316L blades for Microbial applications or Marine type impellers for Cell Culture Applications and other on demand basis	
12.	Baffles	Removable Type Two/ Four number Baffles provided in Microbial Culture vessels.	
13.	Agitation	Variable speed control and Display on HMI/TFT.	
14.	Peristaltic Pumps	One fixed speed peristaltic pump fitted on the control panel for the addition of feed or substrate,two fixed speed peristaltic pumps for Acid/Base dosing or additional pumps on demand basis.	
15.	Heating	Inbuilt Electric heating element fixed / incapsulated in a tube on the top of flange/ heating blanket.	
16.	Temperature control	PID control through microprocessor with TFT display / PLC with HMI having control accuracy of +0.2 Deg. C.	
17.	Software	Data Acquisition/ Software with RS 232C Serial communication/USB Interface to PC for trends/graphs and tabular form DATA AQUISITION with inbuilt memory for data storage.	
18.	Power Supply	230V+ 10%,AC,50 Hz.	
19.	UPS	2.0 KVA or more UPS branded with at least 30 minutes back up to	

		be quoted separately with offer	
20.	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.	
21.	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument.	
22.	Warranty:	The instrument Lab Fermenter including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
23.	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
24.	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
25.	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
26.	Validity of Quotation:	Minimum 3 months.	
27.	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

13. Technical Specifications For Real Time PCR

Sr. No.	Specification and Description
1.	The system should have block of 96 x 0.2 ml tubes or plate to run typical 0.2ml tubes, strips, and plates
2.	The base thermal cycler should be able to do standard PCR
3.	The System should have a gradient block offering temperature differential range of 1-24° C.
4.	The Gradient Block should offer Dynamic Ramping.
5.	Excitation Source: LEDs ,Detection Source: Photodiodes
6.	The system should detect minimum 2 fluorophores in the same tube.
7.	The system should be capable of Detecting commercially available universal dyes like FAM,SYBR Green I, VIC, HEX, TET, Cal Fluor gold 540, ROX, Texas sRed, etc.
8.	The system should have maximum ramping speed not less than $5^{O}C$/ sec.
9.	Peltier Cooling & Heating for uniform temp control
10.	Channel dedicated for FRET experiments is preferred
11.	Excitation –Emission range: 450- 580nm or better
12.	Dynamic range of 9 orders or above
13.	Open system capable of running various chemistries, reagents and plastic ware so that different chemistries using TaqMan, SYBR green etc all can be performed.
14.	Temperature range 0– 100 ^{O}C with accuracy of ±0.2 ^{O}C and uniformity of a. ±0.4 ^{O}C within 10 sec of arrival at 90 ^{O}C
15.	System must be capable of working with minimum sample volume from 1- 50µl with 10-25 µl recommended.
16.	Should have multiple scan modes with a FAST scan option for reading all wells in 3 seconds
17.	Software should have express load feature which allows entry of data after experiment.
18.	And a special software to publish data as per MIQE guidelines should be supplied free of cost.
19.	Real time PCR should be licensed for both IVD and Research applications and license copy must be provided.
20.	E-mail Notification facility with data file after the run is complete is needed.
21.	A compatible branded PC Minimum i5,4GB Ram, 500 GB HDD,19inches falt color monitor, Windows 10 professional should be provided for running the system. (optional)
22.	2.0 kva Online UPS with 15 minutes back-up to be provided with the machine and rates to be quoted separately with offer.
23.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.
24.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.
25.	Warranty: The instrument Real Time PCR including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.

26.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
27.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
28.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
29.	Validity of Quotation: Minimum 3 months.
30.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Real Time PCR

Quantity: 1 no.

Sr. No.	Specification and Description	Compliance Yes/No
1.	The system should have block of 96 x 0.2 ml tubes or plate to run typical 0.2ml tubes, strips, and plates	
2.	The base thermal cycler should be able to do standard PCR	
3.	The System should have a gradient block offering temperature differential range of 1-24º C.	
4.	The Gradient Block should offer Dynamic Ramping.	
5.	Excitation Source: LEDs ,Detection Source: Photodiodes	
6.	The system should detect minimum 2 fluorophores in the same tube.	
7.	The system should be capable of Detecting commercially available universal dyes like FAM,SYBR Green I, VIC, HEX, TET, Cal Fluor gold 540, ROX, Texas sRed, etc.	
8.	The system should have maximum ramping speed not less than $5^{O}C$/ sec.	
9.	Peltier Cooling & Heating for uniform temp control	
10.	Channel dedicated for FRET experiments is preferred	
11.	Excitation –Emission range: 450- 580nm or better	
12.	Dynamic range of 9 orders or above	
13.	Open system capable of running various chemistries, reagents and plastic ware so that different chemistries using TaqMan, SYBR green etc all can be performed.	
14.	Temperature range 0– 100 ^{O}C with accuracy of ±0.2 ^{O}C and uniformity of b. ±0.4 ^{O}C within 10 sec of arrival at 90 ^{O}C	
15.	System must be capable of working with minimum sample volume from 1- 50µl with 10-25 µl recommended.	
16.	Should have multiple scan modes with a FAST scan option for reading all wells in 3 seconds	
17.	Software should have express load feature which allows entry of data after experiment.	
18.	And a special software to publish data as per MIQE guidelines should be supplied free of cost.	
19.	Real time PCR should be licensed for both IVD and Research applications and license copy must be provided.	
20.	E-mail Notification facility with data file after the run is complete is needed.	
21.	A compatible branded PC Minimum i5,4GB Ram, 500 GB HDD,19inches falt color monitor, Windows 10 professional should be provided for running the system. (optional)	
22.	2.0 kva Online UPS with 15 minutes back-up to be provided with the machine and rates to be quoted separately with offer.	
23.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.	
24.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.	
25.	Warranty: The instrument Real Time PCR including UPS quoted for it should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or	

	replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
26.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
27.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
28.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
29.	ity of Quotation: Minimum 3 months.	
30.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

14. Technical Specification for Total Organic Carbon(TOC) Analyzer

Sr. No.	Specification and Description
1.	Limit of detection: 0.05 ppm
2.	Sample temperature range: 10-60°C
3.	Analysis Modes: TIC, NPOC, TC, TOC, (TC-TIC)
4.	Calibration stability: up to 6 months
5.	Result time should be less (Approx. 15-20 min.)
6.	Measuring Range should be up to 50, 000 ppm
7.	Maximum Relative Humidity: Up to 95%, non-condensing
8.	Drain: Gravity drain
9.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.
10.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.
11.	Warranty: The instrument Total Organic Carbon(TOC) Analyzer including UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
12.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
13.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
14.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
15.	Validity of Quotation: Minimum 3 months.
16.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Total Organic Carbon (TOC) Analyzer

Quantity: 1 no.

Sr. No.	Specification and Description	Compliance Yes/No
1.	Limit of detection: 0.05 ppm	
2.	Sample temperature range: 10-60°C	
3.	Analysis Modes: TIC, NPOC, TC, TOC, (TC-TIC)	
4.	Calibration stability: up to 6 months	
5.	Result time should be less (Approx. 15-20 min.)	
6.	Measuring Range should be up to 50, 000 ppm	
7.	Maximum Relative Humidity: Up to 95%, non-condensing	
8.	Drain: Gravity drain	
9.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.	
10.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.	
11.	Warranty: The instrument Total Organic Carbon(TOC) Analyzer including UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
12.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
13.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
14.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
15.	Validity of Quotation: Minimum 3 months.	
16.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

15. Technical Specifications for Automatic Kjeldahl Nitrogen Analyzer

Sr. No.	Specification and Description
1.	Complete microcomputer control.
2.	Self inspecting function for all pump, value and detector, easy trouble shooting
3.	Compatible with 42 digestion tubes or more
4.	Automatic distillation, titration, calculation, printing, waste, cleaning system.
5.	Large-screen color touch screen, friendly man-machine dialogue.
6.	High-precision liquid pump.
7.	No loss of Nitrogen
8.	Accurate dosing of reagents
9.	Distillate temperature stays below threshold
10.	Data Exporting to pen drive or PC
11.	Drip tray collects splashes
12.	Zero pressure steam generator
13.	Measuring Range: 0.1-240mgN
14.	Analysis time: 4-6 minutes/sample
15.	Sample amount: Solid 5g/sample, liquid 20ml/sample
16.	Cooling Water Consumption in the Distillation process:- 1.5L/ minute
17.	Data Storage capacity: 140000 groups
18.	Power supply: 220AC±10%, 50Hz, 2Kw
19.	Output interface: USB or RS 485 interface Data transfer
20.	Recovery Ratio: 99.5%
21.	Repeatability: ±0.5%
22.	Requirement of Cooling water: $<18^0$C
23.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.
24.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.
25.	Warranty: The instrument **Automatic Kjeldahl Nitrogen Analyzer** including UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
26.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
27.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
28.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
29.	Validity of Quotation: Minimum 3 months.
30.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Automatic Kjeldahl Nitrogen Analyzer

Quantity: 1 no.

Sr. No.	Specification and Description	Compliance Yes/No
1.	Complete microcomputer control.	
2.	Self inspecting function for all pump, value and detector, easy trouble shooting	
3.	Compatible with 42 digestion tubes or more	
4.	Automatic distillation, titration, calculation, printing, waste, cleaning system.	
5.	Large-screen color touch screen, friendly man-machine dialogue.	
6.	High-precision liquid pump.	
7.	No loss of Nitrogen	
8.	Accurate dosing of reagents	
9.	Distillate temperature stays below threshold	
10.	Data Exporting to pen drive or PC	
11.	Drip tray collects splashes	
12.	Zero pressure steam generator	
13.	Measuring Range: 0.1-240mgN	
14.	Analysis time: 4-6 minutes/sample	
15.	Sample amount: Solid 5g/sample, liquid 20ml/sample	
16.	Cooling Water Consumption in the Distillation process:- 1.5L/ minute	
17.	Data Storage capacity: 140000 groups	
18.	Power supply: 220AC±10%, 50Hz, 2Kw	
19.	Output interface: USB or RS 485 interface Data transfer	
20.	Recovery Ratio: 99.5%	
21.	Repeatability: ±0.5%	
22.	Requirement of Cooling water: $<18^0C$	
23.	Pre-installation requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.	
24.	Installation Commissioning and Application training: Free of cost at site for a group of technical staff/ students for operating the instrument.	
25.	Warranty: The instrument **Automatic Kjeldahl Nitrogen Analyzer** including UPS should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should	

	explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
26.	Comprehensive Maintenance Contract (CMC): After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
27.	Installation in India: Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
28.	Performance: Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
29.	Validity of Quotation: Minimum 3 months.	
30.	Submission of Bids: Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

16. Technical Specification for Bio-Safety Cabinet

Sr. No.	Specification	Description
1.	Air Balancing	100% exhaust
2.	Inside Pressure	Negative Pressure
3.	Particle retention	0.3 Micron & Above
4.	Inflow Velocity	100 FPM±20
5.	Exhaust Velocity	80FPM±20
6.	Noise level	65 decibel on "A" scale±5
7.	Ultraviolet lamp	Branded Smake–1No.
8.	Illumination	LED Fitting
9.	Pre filters	Attached
10.	HEPA filters	0.3 Micron and efficiency 99.97 %
11.	Exhaust Air Blower	Attached
12.	1No. Pressure Differential	Digital Gauge
13.	Front Panel	Polycarbonate Front door with Pneumatic Lift & Glove Port Arrangement and full air tight construction
14.	Glove Port	Gloves: 6" dia, Gloves & Glove ports
15.	Overall Size	W1700xD750xH2050mm
16.	Working Size	W1200xD600xH600mm
17.	Material construction	The Cabinet and working table made from Stainless Steel with Matt finish. Working zone is lined with stainless steel material**.**
18.	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.
19.	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument.
20.	Warranty:	The instrument Bio Safety Cabinet should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.
21.	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.
22.	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.
23.	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.
24.	Validity of Quotation:	Minimum 3 months.
25.	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Bio-Safety Cabinet

Quantity: 1 no.

Sr. No.	Specification	Description	Compliance Yes/No
1.	Air Balancing	100% exhaust	
2.	Inside Pressure	Negative Pressure	
3.	Particle retention	0.3 Micron & Above	
4.	Inflow Velocity	100 FPM±20	
5.	Exhaust Velocity	80FPM±20	
6.	Noise level	65 decibel on "A" scale±5	
7.	Ultraviolet lamp	Branded Smake–1No.	
8.	Illumination	LED Fitting	
9.	Pre filters	Attached	
10.	HEPA filters	0.3 Micron and efficiency 99.97 %	
11.	Exhaust Air Blower	Attached	
12.	1No. Pressure Differential	Digital Gauge	
13.	Front Panel	Polycarbonate Front door with Pneumatic Lift & Glove Port Arrangement and full air tight construction	
14.	Glove Port	Gloves: 6" dia, Gloves & Glove ports	
15.	Overall Size	W1700xD750xH2050mm	
16.	Working Size	W1200xD600xH600mm	
17.	Material construction	The Cabinet and working table made from Stainless Steel with Matt finish. Working zone is lined with stainless steel material**.**	
18.	Pre-installation requirement:	Necessary pre-installation advice should be sent immediately after the placement of the order.	
19.	Installation Commissioning and Application training:	Free of cost at site for a group of technical staff/ students for operating the instrument.	
20.	Warranty:	The instrument Bio Safety Cabinet should be under on site Comprehensive warranty for three (3) years from the date of installation by the OEM or its representative. Comprehensive warranty should explicitly include all spare	

		parts and system consumable part. Any repair work or replacement of spares needs to be done on site, the manufacturer must confirm this in their quotation.	
21.	Comprehensive Maintenance Contract (CMC):	After the completion of 3 years OEM warranty, two years extended CMC must be quoted without which the tender will be rejected.	
22.	Installation in India:	Detailed lists of users in India with contact details for the quoted equipment should be provided. Preferably, there should be atleast one same quoted equipment installed/ordered in India in last 5 years otherwise the tender will not be considered.	
23.	Performance:	Satisfactory performance of instrument and after sales service from existing users will be considered by the committee in evaluating the technical bid.	
24.	Validity of Quotation:	Minimum 3 months.	
25.	Submission of Bids:	Tender should be submitted in two parts- Technical and Financial.	

Signature of Tenderer

Name:

Designation:

Organization Name:

Contact No.:

ANNEXURE – 06

'INSTRUCTIONS TO BIDDERS'

Downloading of Tender Documents : : ----------(05:00 PM)

e-Bid Submission Closing Date : : 18.01.2023 (05:00 PM)

Date of Opening of Technical Bids : :20.01.2023 (11:00 AM)

The Instructions given below must be read very carefully, as failure in compliance with any of these may render the offer liable for rejection. If a bidder has any doubt about the meaning of any stipulation herein, General Purchase Condition, specification of *materials or any other enclosed* document, he should immediately obtain the clarification/information in writing.

1. Ernest money Deposit (EMD)

1/1. Offers must accompany online EMD submission slip (www.mptenders.gov.in) drawn-in favour of "Registrar, Jiwaji University, Gwalior", .

The EMD shall be forfeited, if:

i) Bidder withdraws the bid before expiry of its validity.

ii) Successful bidder does not accept the order or fails to enter into a contract within validity period of offer.

iii) Successful bidder fails to furnish Security Deposit within one month of intimation/ date of issue of Purchase Order.

1/3. The EMD of unsuccessful bidders shall be returned as soon as the tenders are finalized.

2. **Acceptance of University Payment Terms**

The Standard Payment terms shall be –

100% of all inclusive price of the materials will be paid on receipt and acceptance of the material in good condition, installation and commissioning of the equipment supplied at site (LC will be opened in case of imported equipments if quoted in foreign exchange) and after furnishing of Bank Guarantee / FDR for 10% of the contract covering the guarantee period subject to penal provisions applicable in case of delay in supply and commissioning as per the condition 2.4 of Annexure – 07.

3. **Price Basis** :

The prices quoted shall be on FOR destination basis as per annexure-04and also shall include :

(a) Transit Insurance :

(b) All Taxes, Duties and Levies.

Note :-Company/bidder should attach a letter stating in which currency they have quoted the price in price bid form. In case of imported equipment price has to be quoted in the currency of country of origil tailing which tender will be rejected.

4. **Cost compensation for Deviation** :

Deviations specifically declared by the bidders in respective Deviation Schedules of Bid Proposal Sheets only will be taken into account for the purpose of evaluation . The bidders are required to declare the prices for the withdrawal of the deviations declared by them in the Deviation Schedules.

Offers should strictly be in conformity with specifications / drawings/samples as stipulated in the enquiry. In case no deviations are indicated, it shall be taken for granted that item(s) has/have been offered strictly as per the requirements given in the enquiry.

5.0 **Delivery** :

5.1 Delivery Schedule :

The Supply, Installation, and Commissioning of the material: The bidder shall offer his best, realistic and firm delivery, which shall be specific and guaranteed. Delivery period shall be reckoned from the date of P.O. which is the first intimation of acceptance of bidder's offer. Final date of delivery shall be evidenced by date of dispatch of materials as per transporter's Lorry Receipt/Goods Receipt/RR/PWB/AWB. For delivery beyond contractual delivery period, provisions of 'General Purchase, conditions' shall apply.

5.2 **Early Delivery** :

It shall be noted that if an order is placed on higher bidder, in preference to lowest acceptable offer, in consideration of an earlier delivery, the bidder shall be liable to the University, the difference between the ordered rate(s) and the rate(s) quoted by the lowest acceptable bid in case the tenderer fails to complete the supply in terms of such order within the date(s) of delivery specified in the tender and incorporated in the order. This is without prejudice to other rights of the University under terms of order.

6. It is not binding on University to accept the lowest or any bid. The University reserves the right to place orders for individual items with different bidders and to revise the quantities at the time of placing the order and in such event also, the quoted rates, terms and conditions shall apply. The order for the materials may also be split up between different bidders to facilitate quick delivery of critically required materials. University further reserves the right to accept or reject any/all bids without assigning any reason thereof. Final decision on bids also depends on the components/accessories/additional features offered.

7. The University at its sole discretion unilaterally may change the quantities to the extent of $\pm$ 30% as indicated in tender enquiry. The successful bidder shall be bound to supply these quantities at the same rate and on the same terms and conditions.

8. Tenderers shall fill in the enclosed Performa with regard to deviations /variations (Annexure -08) and submit the same along with their offer.

9. Orders placed against this tender enquiry shall be subject to 'General Purchase Conditions of University, copy of which is enclosed. Bidders are requested to confirm acceptance of these conditions into in their offer.

10. Make/Brand of items offered shall be specified failing which offers are liable to be rejected. It shall be appreciated if one copy of detailed descriptive literature/ pamphlets is enclosed along with the offer which may help technical evaluation. In a case material offered is ISI Marked /tested at any Govt. Recognized test house; copies of relevant certificates shall be furnished along with the offer.

ANNEXURE -07

GENERAL PURCHASE CONDITIONS

SECTION –I

GENERAL

1.1 The following terms and expressions used herein shall have the meaning as indicated therein Supplier / Vendors; shall mean the individual firm or company whether incorporated or otherwise in whose name the purchase order is addressed and shall include its permitted assignees and successors. Purchaser shall mean Registrar Jiwaji University, Gwalior – 474011.

1.2 **Reference :**
The purchase order number must appear on all the correspondence, packing slips, invoices, drawing or any other document or paper connected with the purchase order:

1.3 **Waiver :**
Any waiver by the purchaser of the terms and conditions of the purchase order shall not constitute any right for subsequent waiver of any other terms or conditions.

1.4 **Sub-letting and Assignment :**
The supplier shall not, save with prior consent in writing of the University/ sublet, transfer or assign this order or any part thereof or interest therein or benefit or advantage, thereof in any manner, whatsoever provided nevertheless that any such consent shall not relieve the supplier from any obligation, duty or responsibilities under the contract.

1.5 **Information provided by the University** :
All drawings, data and documentation that are given to the supplier by the University for the Execution of the order are the property of the University and shall be returned when demanded. Except for the purpose of executing the order of the University, the supplier shall ensure that the above documents are not used for any other purpose. The supplier shall further ensure that the information given by the University is not disclosed to any person, firm body, corporate and/or authority and make every effort to keep the above information strictly confidential. All such information shall remain the absolute property of the University.

1.6 **Supplier Liability** :
Supplier hereby accepts full responsibility and indemnifies the University and shall hold the University harmless from all acts of omission and commission on the part of the supplier, his agents, his subcontractors and employees in execution of the purchase order. The supplier also agrees to defend and hereby undertakes to indemnify the University and also hold it harmless from any and all claims for injury to or death of any and all persons including but not limited to his/her employees and for damage to the property arising out of or in connection with the performance of the work under the purchase order.

1.7 Access to supplier's premises :
The University and/or its authorized representative shall be provided access to the supplier's and/or his sub-contractor's premises, at any time during the pendency of the purchase order, for expediting the supplies, inspection, checking etc.

1.8 Modifications :

The purchase order constitutes an entire agreement between the parties hereto. Any modification to this order shall become binding only upon the same being confirmed in writing duly signed by both the parties.

1.9 **Inspection/Checking/Testing :**

All materials/ equipment to be supplied against this purchase order shall be subject to inspection/ checking /testing by the University or its authorized representative at all stages and places, before, during and after the manufacture. All these tests shall be carried out in the presence of authorize representative of the University. Supplier shall notify the University for inspection of materials/equipment when they are ready, giving at least 10 days notice. If upon receipt at our Stores, the material/equipment does not meet the specifications, they shall be rejected and returned to the supplier for repair/modification etc. or for replacement. In such cases all expenses including to-and- fro freight, re-packing charges, transit insurance etc shall be to the account of supplier.

Inspection by the authorized representative of the University or failure of the University to inspect the material/equipment shall not relieve the supplier of any responsibility or liability under this purchase order in respect of such material/ equipment and it shall not be interpreted in any way to imply acceptance thereof by the University. Whenever specifically asked for by the University, the supplier shall arrange for inspection/ testing by Institutional Agencies such as Lloyds Register of Industrial Services, Boiler Inspectorate, RITES. In such cases supplier shall adhere to the inspection/ testing procedures laid down by such agencies. All expenses in this regard including inspection fees shall be to the suppliers account unless agreed to the contrary and specified in the purchase order.

1.10 **Packing and Marking** :

All materials/equipment shall be securely packed to the requirements of transportation by Air/Rail/Road/Sea. All exposed services/ connections/, protrusions shall be properly protected. All unexposed part shall be

packed with due care and the packages should bear the words 'handle with care'. The packing requirements of Air/Rail/Road transport shall be complied with so as to obtain clear Airway/Railway Receipt/Lorry Receipt i.e. without any qualifying remarks.

All packages and unpacked materials shall be marked with the name of Consignor, Consignee, purchase order No., gross and Net weight, sign of handling, if any, with indelible paint in English at least at two places. In case of bundles, metallic plates marked with the above details shall be tagged to such bundles.

1.11 **Dispatch of Materials**:

The supplier is responsible for the safe delivery of the goods in good condition at destination stores. The supplier should acquaint himself of the conditions relating to handling and transport of the goods to destination and shall include and provide for security and protective packing of the goods so as to avoid damage in transit.

1.12 **Validity of offers**:

The offers shall be valid for a period of 90 days (Depending on the type of equipment) from the date of opening of bids. The period of validity cannot be counted from any other date other than the date of opening the bids. During this period the tenderer shall not be permitted to withdraw or vary his offer made and if the tenderer does so, the EMD shall be forfeited.

1.13 **Jurisdiction**:

All and any disputes or difference arising out of or touching this order shall be decided only by the Courts or Tribunals situated in Gwalior.

1.14 The Registrar, Jiwaji University, Gwalior does not bind himself to accept the lowest or any tender and he reserves the right to reject any offer without assigning any reason.

SECTION-II
FINANCIAL

2.1 **Prices**:

Prices quoted shall be inclusive of all taxes and firm till completion of the programme.

2.2 **Terms of payment**:

2.2.1. Payments by the purchaser shall be made through Account payee cheques only. **Bank charges if any shall be borne by the supplier. In case of imported equipments LC will be opened.**

2.2.2 If the supplier has received any overpayments by mistake or if any amounts are due to the University from the supplier due to any other reasons and when it is not possible to recover such amount under the present purchase order, the University reserves the right to collect the same from any other amounts and/ or Bank Guarantee given by the supplier due to or with the University.

2.3 **Liquidated Damages/ Failure and Termination**:

2.3.1 In the event of any delay in the supply of material beyond the stipulated date of completion including any extension permitted in writing, the University reserves the right to recover from the supplier a sum equivalent to 0.5% of the value of delayed materials/ equipment for each week of delay and part thereof subject to a maximum of 5% of the total value of the order.

2.3.2 Alternatively, the University reserves the right to give the contract else where at the sole risk and cost of the supplier and recover all such extra cost incurred by the University in procuring the materials from the other source.

2.3.3 Alternatively University may cancel the Purchase Order completely or partly without prejudice to its right under the alternatives mentioned above.

2.3.4 In case of recourse to alternative 2.3.2 and 2.3.3. above, the University shall have the right to repurchase the materials which is readily available in the market to meet the urgency requirements caused by supplier's failure to comply with the scheduled delivery period irrespective of the fact whether the material/ equipment is similar or not.

2.4 **Delivery Schedule**:

Time is essence of this order and no delay shall be allowed in the delivery time/ delivery schedule mentioned in the purchase order.

2.5 **Performance Bank Guarantee**:

The supplier shall ensure that all materials/equipment under this purchase order shall conform to University's requirements and specifications. An additional security in the form of Performance Bank Guarantee / FDR is essential for satisfactory performance of the equipment over a period of time. In view of this, the supplier shall be required to furnish a Bank Guarantee / FDR (10% of order value) as follows against any manufacturing defects/ poor workmanship/poor performance. In case any deficiencies are found during this period, the same shall be repaired/rectified/replaced free of cost. BG / FDR shall be from any Scheduled Bank or any other bank as approved by University from time to time in the prescribed performa.

a. Bank Guarantee / FDR for 10% of the order value with validity up to warranty period from the date of installation of equipment.

The University shall at its discretion have recourse to the said bank guarantee / FDR for recovery of any or all amount due from, the supplier in connection with the purchase order including of guarantee obligations. Checking/approval of supplier's drawings, inspection and acceptance of materials/equipment furnishing to effect shipment and/or work done by erection, installation and commissioning of the equipment by University or any other agency on behalf of the University shall not in way relieve the supplier from the responsibility for proper performance during the guarantee period.

2.6 **Insurance**:

Supplier shall arrange suitable insurance cover at his risk and cost for the transit of the equipment upto for installation and testing.

2.7 **Removal of rejected goods and Replacement**:

a) If upon delivery, the material/equipment is found not in conformity with the specifications stipulated in the purchase order, whether inspected and approved earlier, or otherwise, such material/ equipment will be rejected by the University or his authorized representative. A notice to this effect shall be issued to the supplier, normally within 30 days from the date of receipt of materials at our Stores.

b) Supplier shall arrange suitable replacement supplies and remove the rejected goods within 30 days from the date of notice failing which, the goods shall be dispatched to, vendor by road transport on 'Freight to pay basis at supplier's risk and cost.

c) External damages or shortages that are prima-facie as a result of rough handling in transit or due to defective packing shall be intimated to the supplier within, a period of one month of the receipt of the materials, spares etc. In case of Internal defects, damages of shortages of any internal part, which cannot ordinarily be detected on a superficial visual examination, due to bad handling in transit of defective packing or any other reason, it should be intimated to the supplier within 3 months from the date of receipt of the material. In either case the damaged or defective material should be replaced by the supplier free of costs.

d) If no steps are taken within 15 days of receipt of intimation of defects or such other reasonable time as the University may deem proper to afford, the University may without prejudice to its other rights and remedies arrange for repairs/rectification of the defective materials or replace them entirely and recover the expenditure incurred on account of these actions from the deposits such as EMD,SD and performance guarantees or other monies available with the University or by resorting to legal action.

2.8 **Force Majeure** :-

2.8.1 The supplier shall not be liable for delay or failing to supply the material for reasons of Force Majeure such as Act of God, Act of War, Act of Public Enemy, Natural Calamities, fires, Floods, Frost, Strikes. Lockouts etc. Only those causes which have duration of more than 7 days shall be considered for force Majeure.

2.8.2 The Supplier shall within 10 days from the beginning of such delay notify the University in writing the cause of delay. The University shall verify the facts and grant such extension of time as facts justify.

2.8.3 No price variation shall be allowed during the period of force majeure and liquidated damages would not be levied for this period.

2.8.4 At the option; of University, the order may be cancelled. Such cancellation, would be without any liability whatsoever on the part of the University. In the event of such cancellation, supplier shall refund any amount advanced or paid to him by the University and deliver back any materials issued to him by the University and release facilities, if any, provided by the University.

ANNEXURE -08

DEVIATIONS

Bidder's Name and Address :_____

_____

To
The Registrar,
Jiwaji University
GWALIOR – 474011 (M.P.)
Dear Sir,

Sub :- Supply of _____ against enquiry No. _____ Dated _____.

We confirm that following are the only deviations and variations, from any exception to specifications and tender documents for the above mentioned subject supplies against enquiry offer. These deviations and variations are exhaustive. Except for these deviations, the entire supplies shall be executed as per specifications and tender documents. Further, we agree those additional conditions, if any, found in our offer other than those stated below, save that pertaining to any rebates offered shall not be given effect to.

Sl.No.	Description of Deviation Conditions of	Ref. of Page, Clause	*Monetary, Implications of the bid-documents in case of withdrawal Rs. (in figures) Rs. (Inwords)

Note : Here the tenderer should indicate the amount of money, if any, which conditions/deviations and accepting the condition as stipulated in tender documents (Use additional Sheet of the same size and format if necessary).

Signature : _____

Designation :_____

ANNEXURE -09

Guide-lines for Submission of Bank Guarantee towards Performance Security

The Bank Guarantee shall fulfill the following conditions failing which it shall not be considered valid:

1. Bank Guarantee shall be executed on non-judicial stamp paper of applicable value purchased in the name of bank.
2. Non-judicial stamp paper shall be used within 6 months from the date of purchase. Bank Guarantee executed on the stamp paper of more than 6 months old shall be treated as invalid.
3. The contents of the Bank Guarantee shall be as perourper form (Annexure -10)
4. The Bank Guarantee should be executed by a scheduled bank or banks viz. _____ _____ _____ _____
5. The executor of Bank Guarantee (Bank Authority) should mention the Power of Attorney No. and Date executed in his/her favour authorizing him/her to sign the document or produce the Photostat copy of Power of Attorney.
6. All conditions, corrections, deletion in the Bank Guarantee should be authenticated by signature of Bank Officials signing the Bank Guarantee.
7. Each page of Bank Guarantee shall bear signature and seal of the Bank.
8. Two persons should sign as witnesses mentioning their full name and address.

Registrar,
Jiwaji University,
Gwalior -474011 M.P.

ANNEXURE -10

BANK GUARANTEE PROFORMA FOR PERFORMANCE SECURITY

This agreement has to be executed on a Non-Judicial Stamped Paper worth Rs. 1000/-(Rs. One Thousand) Whereas the _____ here-in-after called (The Bidder) has submitted their bid dated_____for the supply of_____(Here-in-after called "the Bid")_____ KNOW ALL MEN by these presents that we_____(Hereinafter called the Bank") are bound unto Registrar, Jiwaji University, Gwalior, M.P. Hereinafter called "the purchaser") in the sum of _____ for which payment will and truly to be made to the said purchaser, the bank binds itself, its successors and assigns by these presents. Sealed with the common Seal of the said Bank this_____day of_____2022'

THE CONDITIONS OF THIS OBLIGATION ARE:

1. When the successful tenderer does not accept the order after issue of preliminary acceptance letter/letter of indent/purchase order.
2. When the successful tenderer fails to furnish the security deposit within 30 days from the date of issue of preliminary acceptance letter or the letter of indent or purchase order _____.
3. When tenderer is disqualified for reasons outlined in_____.
4. When tenderer alters his prices or withdraws his offer during the validity period. We undertake to pay to the purchaser the above amount within one week upon receipt of its first written demand without the purchaser having to substantiate his demand, without referring to the supplier and without questioning the right of University to make such demand or the propriety or legality of the demand provided that in its demand the purchaser will note that the amount claimed by it is due to it owing to any of the occurrence of the above mentioned conditions, specifying the occurred condition or conditions.

Not with standing anything contained in the foregoing our liability under this guarantee is restricted to_____(Rupees_____ only). Our guarantee shall remain in force until_____. Unless a claim within 3 months from that date, all your rights under this guarantee shall be forfeited and we shall be relieved and discharged from all liability thereafter.

We_____Bank Limited lastly undertake not to revoke this guarantee during its currency except with the previous consent of University in writing.

Date the_____Day_____200 for_____Bank Ltd.

ANNEXURE-11

TECHNICAL BID FORM

S.No.	Documents	Copy submitted or no (Yes/No)
1	The Company/the tenderer should be in existence for the last 5 years As per Annexure-02	
2	The tenderer should be a Manufacturer or the authorized representative of equipment or other respective products/items	
3	IT returns for the last three Assessment years. 2018-2019, 2019-2020 ,2020-2021	
4	Technical Specifications of Annexure- 05 (Complied or Not-Complied report) along with supporting documents of the items bided (items 1 to 18), for the scientific equipments clearly mentioning the make and model	
5	List mentioning the addresses and contact persons with phone numbers of the Service Centers	
6	The list of customers, to whom the bidder had supplied identical materials in the past	
7	Annexure-08	

ANNEXURE- 12

PROFORMA OF PERFORMANCE BANK GUARANTEE

In consideration of the Registrar, Jiwaji University, Gwalior (hereinafter called the "Client") having offered to accept the terms and conditions of the proposed agreement (hereinafter called the "said

Agreement") between Registrar, Jiwaji University, Gwalior and M/s..... (hereinafter called the "said Contractor") for the work of Catering Services having agreed to production of an irrevocable bank guarantee for Rs._____ (Rupees _____ only) as a security / guarantee from the contractor for compliance of its obligations in accordance with the terms and conditions in the said agreement.

We _____ (hereafter referred to as the "Bank") hereby undertake following:

1. We undertake to pay to the Client any money so demanded not withstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under bond shall be a valid discharge of our liability for payment thereunder, and the contractor(s) shall have no claim against us for making such payment.
2. We further agree that the Guarantee herein contained shall (indicate the name of the Bank) remain in full force and effect during the period that would be taken for the performance of the said agreement, and it shall continue to be enforceable till all the dues of the Client under or by virtue of the said agreement have been fully paid, and its claims satisfied or discharged, or till the Client certifies that the terms & conditions of the said agreement have been fully and properly carried out by the said contractor(s), and accordingly discharges this guarantee
3. We further agree with the Client that the Client shall have the fullest liberty without our consent , and without effecting in any manner our obligations hereunder, to vary any of the terms & conditions of the said agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Client against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement, and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said contractor(s) or for any forbearance, act of omission on the part of the Client or any indulgence by the Client to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
4. This Guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).
5. We lastly undertake not to revoke this Guarantee except with the prior consent of the Client in writing.
6. This guarantee shall be valid up to …..... unless extended on demand by the Client Notwithstanding anything mentioned above, our liability against this Guarantee is restricted to Rs._____ (Rupees _____ only) and unless a claim in writing is lodged with us under this Guarantee shall stand discharged.
   Dated the _____ day of ____ for _____

Signature of the authorized officer of the Bank

Name & Designation of the officer

Seal, Name & Address of the Bank and Address of the Branch

ANNEXURE-13

FORMAT OF CONTRACT AGREEMENT

(On Non-judicial Stamp Paper as per m.p Govt. rules)

THIS AGREEMENT made the ..... day of ....., 2022 Between Registrar, Jiwaji University, Gwalior (hereinafter "the Client") of the one part and M/*s* _____ _____ (hereinafter called "the Contractor") of the other part:

WHEREAS the Client is desirous that certain services viz. Supply Catering Services in the tender reference no. _____ Dated _____ and has accepted a bid by the Contractor for the performance services for the sum of *Rs.* _____ */- (Rupees* _____ *only)* (hereinafter called "the Contract Price") and supply of consumables as per rates given in the financial bid of its tender.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to, and they shall be deemed to form and be read and construed as part of this agreement.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:

a) The Letter of Acceptance issued by the Client.
b) The supplier's bid including enclosures, annexure, etc.
c) Tender document along with all enclosed documents.
d) Any other document listed in the supplier's bid and replies to queries, clarifications issued by the service provider, such confirmations given by the bidder which are acceptable to the contractor and the entire Addendum issued as forming part of the contract.

3. In consideration of the payments to be made by the Client to the Contractor as hereinafter mentioned, the Contractor hereby covenant with the Client to provide, the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Client hereby covenants to pay the Contractor in consideration of the provision of the goods and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

Brief particulars of the goods and services which shall be supplied / provided by the Contractor are as under.

Sl. No	**Brief Description of Services**	**Contract Duration**	**Total Price**	**GST tax in %**	**Total value inclusive of GST tax**
1					

IN WITNESS where of the parties here to have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, Sealed and Delivered by the Said _____ (For the Client) In the presence of .....

Signature

Name

Address

Witness 1. 2.

Signed, Sealed and Delivered by the

Said _____ (For the Contractor)

In the presence of .....

Signature

Name

Address

Witness 1. 2.

ANNEXURE -14

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for HPCC System	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Scanning Electron Microscope-EDAX	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

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3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Physical Parameter Measurement System	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Behaviour and Activity Test System	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

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3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Single Crystal X-RAY Difractometer System	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Atomic Absorption Spectrophotometer	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

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4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Aerosol Mass Monitor	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

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COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

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3. Name of the Proprietor / Partner / Director of the Firm :-

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4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Automated Nucleic Acid Extraction System	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

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3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for CHN Analyzer	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

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3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Gas Chromatograph Mass Spectrometer (GCMS)	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

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3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Gel Doc System	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Lab Fermenter	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Real Time PCR	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Total Organic Carbon(TOC) Analyzer	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Automatic Kjeldahl Nitrogen Analyzer	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)

JIWAJI UNIVERSITY, GWALIOR

COMMERCIAL BID (ONLINE) FOR PURCHASE OF Equipments

1. Name of the Firm :-

   ……..

2. Address of the Firm :-

   ……..

3. Name of the Proprietor / Partner / Director of the Firm :-

   ……

4. Telephone No and e-mail ID. :-

   ……

COMMERCIAL BID FORM (e-Bid)

Sr. No.	Equipment	Qty.	Rate / Item	
			Price in Rupees for indigenous items and in foreign/ international currency for items to be imported	
			In Figure	In words
1.	Supply & Installation for Bio-Safety Cabinet	01		

(SIGNATURE OF THE BIDDER WITH NAME & SEAL)