Centre for Development of Advanced Computing

A Scientific Society of Ministry of Electronics & Information Technology,
Government of India
CDAC Knowledge Park, No. 1, Old Madras Road, Baiyppanahalli,
Bengaluru - 560038
Tel: +91-80-25093400
mmg-blrkp@cdac.in
www.cdac.in

Tender No: CDACB/RD24/094

CDAC, Bangalore invites bids for "Supply, Installation & Commissioning of Superconducting Qubits based Quantum Computing Facility (50 to 100 Qubits) at C-DAC Bangalore, Electronic City"

Prospective Bidders may download the Tender Document from www.cdac.in / https://eprocure.gov.in/eprocure/app. Bidders are advised to go through instructions provided at `Instructions for online Bid Submission' and submit duly filled bids online on the website https://eprocure.gov.in/eprocure/app as per the schedule given in the Tender Document.

Tender Schedule

Tender No: **CDACB/RD24/094**

Name of the Institute	Centre for Development of Advanced Computing, Bengaluru 560038.
Place of Supply, Installation & Commissioning, Support etc.	C-DAC, No. 68, Electronic City Phase I, Bengaluru, Karnataka 560100
Date of Release of Tender	01.01.2025
Date of Pre-Bid Meeting	10.01.2025 @ 1500 hrs
Place of Pre-bid Meeting	CDAC Knowledge Park, No. 1, Old Madras Road, Byappanahalli, Bengaluru – 560038.
Last date of submission of bids	21.01.2025@ 1600 hrs.
Date of opening of Technical bids	22.01.2025 @ 1700 hrs.
Place of opening of technical bids	CDAC Knowledge Park, No. 1, Old Madras Road, Byappanahalli, Bengaluru - 560038

1. *Instructions for On-line Bid Submission*

   The bidders are required to submit soft copies of their bids electronically through the portal (www.eprocure.gov.in) using valid Digital Signature Certificates (DSC). The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal. More information useful for submitting online bids on the CPP Portal may be obtained at: https://eprocure.gov.in/eprocure/app.

2. *Assistance to Bidders:*

   Any query relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24*7 CPP Portal Helpdesk on :- 0120-4200 462, 0120-4001 002, 0120-4001 005, 0120-6277 787,

· e-mail for Technical - support-eproc@nic.in.

It is recommended for the interested vendors to attend the pre-bid meeting (at C-DAC, EC, Bangalore / Online) to get a better understanding about the scope/nature of work involved in the Supply, Installation & Commissioning of

Superconducting Qubits based Quantum Computing Facility (50 to 100 Qubits). The schedule with venue (online meeting link / venue address), of the pre-bid meeting shall be informed to the interested vendors through email at least a week in advance. The interested vendors who are willing to attend the pre-bid meeting need to confirm the same by replying to the email for pre-bid meeting call within three working days.

SECTION I: INSTRUCTIONS TO BIDDERS (ITB)

1. INTRODUCTION:

Centre for Development of Advanced Computing (C-DAC) - is a scientific society under the administrative control of the Ministry of Electronics & Information Technology, Government of India. As a part of the project awarded under the Establishment of Superconducting based Quantum Computing Reference Facility', C-DAC invites `ON-LINE' bids from eligible bidders for supply, installation and commissioning of Superconducting qubits based Quantum Computing Facility (50 to 100 Qubits) for Research and Development (R&D) purposes, as per Schedule of Requirements (Section-IV) and other terms and conditions stipulated in this document.

1.1. Subject Matter of Procurement

1.1.1 Scope of Procurement

The scope of this procurement includes supply, installation and commissioning of a superconducting qubits based quantum computing facility (in the range of 50 to 100 Qubits), including associated services for R&D purposes. This innovative co-development procurement aims to enhance the country's competitiveness in quantum technologies by using the modular components setup as part of this facility to test, validate and benchmark any indigenously developed technologies / components. The project seeks to establish this innovative facility and make it accessible to other research institutes and enthusiasts in the quantum technologies domain across India. This initiative aims to position India as a global leader in quantum technology development, delivering benefits to the nation by advancing applications that harness the potential of quantum computers for the betterment of humanity. The project also aims on using this facility for conducting experiments to create capabilities in quantum hardware, device designs, quantum processing technologies, and quantum software and algorithms, ensuring long-term competitiveness and operational freedom.

1.1.2. Project Deliverables

The procurement involves the supply, installation and commissioning of a superconducting qubits based quantum computing facility:

Deployment and Commissioning phase: (9 months from the date of Purchase Order release)

- Commissioning of a quantum computer in the range of 50 to 100 qubits in compliance with specified technical requirements (including acceptance from CDAC based on the specified acceptance criteria).

1.1.3. Post-Project Service Contract

A service contract will be established for a term of minimum 3 years post-project (From the date of Acceptance of the commissioned facility), covering:

- Training on the usage, maintenance, and calibration of the quantum computer and services.
- Maintenance, error categorization, and root cause analysis.
- Calibration services and automated calibration software.
- System software updates.
- Provision of spare parts if applicable.
- On-site service support with agreed reaction and resolution times.
- Access to QPU Fabrication facility for co-development initiatives by CDAC
- Training due to modifications by the supplier.

1.1.4. Components and Services Included

The procurement includes the following components and services:

- Superconducting qubit processor (50 to 100 qubits)
- Associated control electronics and related software for supporting the qubits offered and further scalable to 250 qubits.
- Peripheral elements (shielding, brackets, etc.)
- Dilution refrigerator with active and passive damping for supporting the qubits offered and further scalable to 250 qubits
- Full capacity DR wiring for supporting the qubits offered and further scalable to 250 qubits
- Comprehensive modular software stack with necessary API support.
- Power conditioning and backup systems
- Environmental monitoring and control systems
- EMI/EMC compliance as applicable
- Comprehensive maintenance & support for minimum of 3 years, and performance guarantees.
- Warranty of goods supplied for minimum of 3 years (extendable to additional 2 yrs.)
- Comprehensive operational training
- Estimated delivery time: 9 months
- Custom duty and delivery charges along with statutory charges, if any- to be included
- Co-development support as highlighted in Sec 1.1.7 of SECTION I.

1.1.5. Background and Expertise

The bidder must have extensive expertise in deploying, commissioning and operating superconducting based quantum computers and expertise in integrating with HPC systems. The bidder must have participated in National/International Quantum Flagship projects and has demonstrated significant milestones in the development/deployment/commissioning/integration of superconducting based quantum computers.

1.1.6. Intellectual Property Goals and Requirements

Ownership of Intellectual property rights:

- The vendor shall grant CDAC a non-exclusive royalty-free license to use the IP provided as part of the project.
- For any IP created jointly by the vendor & CDAC during the project, a clear agreement on ownership and licensing shall be established.
- CDAC shall own the rights to any custom software developed specifically for the project.
- Any improvements or modifications made to IP during the project shall remain the property of CDAC.
- Confidentiality: Both the parties shall agree to maintain the confidentiality of any proprietary or confidential information disclosed during the project. (NDA needs to be signed).

- Both the parties shall agree to the terms to resolve disputes related to IP.

1.1.7. Co-Development Projects

Preference will be given to bidders proposing co-development research projects with C-DAC to be initiated after the Purchase Order is placed. Considering the capabilities of C-DAC, the bidders are expected to propose at least 3 co-development projects in the following areas. The costs associated with implementing these co-development projects on the bidder's end will be covered by the bidder.

- **Hardware (HW) Co-Development:**
  - Control electronics co-development and integration with QPU
  - Other relevant proposals, such as processor development, cryogenic electronics etc., with access to fabrication facilities and labs, will be supported through arrangements made by the vendors.
- **Software, Algorithms and Applications Co-Development:**
  - Development of quantum software, algorithms and applications.
- **Quantum Computer Optimization**
  - Error correction & Optimization of the quantum computer for running algorithms

1.1.8. Documentation and Collaboration

Frequent documentation of progress and close collaboration between the supplier and the organization is required. Significant working hours on the organization's premises may be necessary.

1.1.10. Training and Support

Training shall be provided on the usage, maintenance, and calibration of the quantum computer and the subsystems involved including the DR, Control Electronics and QPU. Ongoing support will be included in the service contract.

2. Contact Information:

Material Management Group
Centre for Development of Advanced Computing (C-DAC)
CDAC Knowledge Park, No. 1, Old Madras Road, Baiyppanahalli, Bengaluru - 560038, INDIA
Tel No.: +91-80-25093400, E-mail: mmg-blrkp@cdac.in

3. Pre-Bid Meeting:

In case of any doubts and/or queries pertaining to technical solution, specifications terms and conditions of the bid, prospective bidder may send their queries in writing through e-mail. (Refer point 2 mentioned above for contact details). The queries, requests for clarifications etc. must be sent at least two days prior to the date of pre-bid meeting. The bidders are requested to go through the entire bid document thoroughly, before raising any query. The pre-bid meeting will be held at C-DAC, Bengaluru as given in schedule, to address the queries raised by the bidders. C-DAC will try to sort out the queries during the meeting, as far as possible. The replies to queries would be made available on C-DAC's web site in due course of time. All the queries, doubts, clarifications etc. must be submitted in xls format only.

Name of the bidder				
Sl.No.	Section / Page No	Clause Reference	Query from bidder	C-DAC Response

4. Two bid System

The Two e-bid systems will be followed for this bid.
The documents pertaining to Technical Bid and Commercial Bid must be uploaded electronically through **https://www.eprocure.gov.in/eprocure/app.**

4.1. Technical bid shall contain

The bidder must upload the following documents through e-Packet – 1, as listed below:

a. Covering letter, as per **Annexure – A**.
b. Authorization letter (on bidder's letterhead) issued by the competent authority of bidder, authorizing the signatory to sign on behalf of the bidder, as per **Annexure – B**.

c. Scanned copy of proof of remittance /transaction slip, by NEFT/RTGS in favour of C-DAC, Bangalore towards Earnest Money Deposit (EMD) of Rs. 1,50,00,000/- (INR One Crore Fifty Lakhs Only) (The proof of remittance/transaction slip or supporting documents, exempting the bidder to submit the tender fees, must be uploaded along with the other documents on or before the Due Date & Time of the Tender). **The document submitted for claiming exemption of EMD should clearly indicate the appropriate category matching the Item Description**.

The offer without the receipt for EMD shall not be considered. The EMD shall bear no interest. **EMD will not be accepted in the form of cash /cheque.**

The account details for remittance are given below:

Name of the Bank	**State Bank of India**
Branch	**Kasturi nagar Branch, Bangalore**
Account No	**54005316791**
IFSC Code No	**SBIN0010365**

d. A copy of Certificate of Incorporation, Partnership Deed / Memorandum and Articles of Association / any other equivalent document showing date and place of incorporation, as applicable, in support of eligibility criteria at para 4.3, Section – II of this document.

e. Copies of PAN and GST registration certificates, as applicable.

f. The certificate/s from a Chartered Accountant for last three financial years indicating the average annual sales turnover.

g. Detailed technical proposal for implementing the project (Refer Section – III (A) for evaluation criteria). Bidders should not mention any details pertaining to the financial aspects of implementing the project in this technical proposal.

h. The documents giving the details of proposed technical solution, including technical specifications, make, model, part numbers of the items & compliance of each item offered etc. as applicable.

i. Copies of documents in support of eligibility requirements stipulated at para 4 Section – II.

a. The undertakings from the Principal Manufacturers (OEMs) of Superconducting quantum computing systems or their respective subsidiary, or their (OEM's) authorized Quantum system integrator as per Annexure – C.

j. In case the bidder offers/bids for all the items - the MAF & other conditions must be fulfilled by the bidder to qualify for further processing.

k. A photocopy of Section – V of the bid (commercial bid) without prices (prices blocked). C-DAC reserves the right to reject the bid in case of discrepancy observed in the unpriced commercial bid and the actual commercial bid.

l. Other documents necessary in support of eligibility criteria, product catalogs, brochures etc.

Note: C-DAC reserves the right to reject the bid if any of the above listed

document/s is not submitted.

4.2. Commercial Bid shall contain:

Duly filled Commercial Bids as per format given in Section – V, complete in all respects with name, designation, email id and contact no.

5. Both the technical bid and commercial bid should be addressed to:

Materials Management Group (MMG)
Centre for Development of Advanced Computing (C-DAC), Knowledge Park,
No. 1, Old Madras Road, Baiyppanahalli, Bengaluru 560038, INDIA
Phone: 080-25093400.

(End of Section – I)

SECTION II: GENERAL CONDITIONS OF CONTRACT (GCC)

1. Location for the Supply, Installation & Warranty Services:

The entire solution comprising of Superconducting Qubits based Quantum Computing Facility (50 to 100 Qubits) as described in Schedule of Requirements (Section – IV) must be supplied, installed, commissioned & supported at:

Centre for Development of Advanced Computing (C-DAC), No. 68, Electronic City Phase I, Bengaluru, Karnataka 560100.

2. Delivery Period:

The entire supplies of items covered in this bid must be supplied, installed and commissioned along with the final acceptance testing within **9 months** from the date of placement of order.

3. Order Placements:

The Supply Order and the payments shall be released by:

Centre for Development of Advanced Computing (C-DAC), Knowledge Park,
No. 1, Old Madras Road, Baiyppanahalli, Bengaluru 560038, Karnataka, INDIA.

4. Eligibility Criteria:

The bidder must comply with the minimum eligibility criteria stipulated below:

4.1 The bidder must submit the documents as listed at para 4.1 and 4.2, Section – I of this document.

4.2 The bidder must be either a Principal Manufacturer (OEM – Original Equipment Manufacturer) of Superconducting quantum computing systems or their respective subsidiary, or their (OEM's) authorized Quantum system integrator.

4.3 The bidder must be a legal entity in India or abroad registered under the appropriate Law/ Act of the respective country / region.

4.4 If the bidder is an authorized system integrator, the specific authorization letter/s from Principal/s, as per Annexure - C must be submitted along with the technical bid. In this case the authorization letter (Annexure – C) issued by the Indian subsidiary of Principal Manufacturer is acceptable.

4.5 If the bid is submitted by the Indian subsidiary of Principal Manufacturer (OEM), the letter from Principal Manufacturer (OEM) must be submitted certifying that the bidder is the subsidiary company of the Principal Manufacturer (OEM) in India.

4.6 The bidder must quote for all the items mentioned in the schedule of requirements.

4.7 The bidder must have a minimum annual sales turnover of Rs. 300 crores in India

or abroad for each of the last three financial years.

4.8 The bidder must have installed and commissioned at least two superconducting qubit-based quantum computing facilities with a usable capacity of a minimum of 50 qubits. Of these, at least one installation must be a production system currently in use by clients. The bidder must submit certificate(s) from the client(s) as part of the bid document.

4.9 The bidder must supply a system with a modular design approach for different subsystems of the Quantum computing facility like Dilution refrigerator, QPU, Control Electronics, Software stack etc., listed in SECTION IV – Schedule of Requirements. The detailed design document highlighting the modularity aspects of the architecture, should be included in the technical proposal document.

4.10 The bidder must submit all the documents as per Document Checklist – Annexure H.

4.11 The bidder must not be blacklisted by any Govt. Organizations in India as on date of submission of the bids. A certificate or undertaking to this effect must be submitted (**Annexure – A**).

4.12 The bidder should provide sufficient documentary evidence to support the eligibility criteria and exemptions mentioned in point 5 below. C-DAC reserves the right to reject any bid not fulfilling the eligibility criteria.

5. Exemptions:

If in the view of bidder, any exemption / relaxation are applicable to them from any of the eligibility requirements, under any Rules, process, Guidelines, Directives of Government of India, bidder may submit their claim for the applicable exemption /relaxation, quoting the valid Rule, process, Guidelines or Directives. In this case the bidder must submit necessary and sufficient valid documents along with the technical bid, in support of their claim. The relevant and valid certificates in support of claim of exemption must be submitted.

6. Amendment to Bidding Documents

6.1 At any time prior to the deadline for submission of bids, C-DAC may, for any reason, whether on its own initiative or in response to the clarification request by a prospective bidder, modify the bid document.

6.2 The amendments to the bid documents, if any, will be notified by release of Corrigendum Notice on www.eprocure.gov.in / www.cdac.in/ against this bid. The amendments/ modifications will be binding on the bidders.

6.3 C-DAC at its discretion may extend the deadline for the submission of bids if it thinks necessary to do so or if the bid document undergoes changes during the bidding period, in order to give prospective bidders time to take into consideration the amendments while preparing their bids.

7. Preparation of Bids

Bidders should avoid, as far as possible, corrections, overwriting, erasures or postscripts in the bid documents. In case however, any corrections, overwriting, erasures or postscripts have to be made in the bids, they should be supported by dated signatures

of the same authorized person signing the bid documents. However, the bidder shall not be entitled to amend/ add/ delete/ correct the clauses mentioned in the entire bid document.

8. Earnest Money Deposit (EMD)

8.1 The Earnest Money Deposit (EMD) of Rs. 1,50,00,000/- only must be submitted prior to the DUE DATE & TIME of submission of the online technical bid. The EMD/BG will be returned to the bidder(s) whose offer is not accepted, within 30 days from the date of opening of commercial bid(s). In case of the bidder whose offer is accepted, the EMD will be returned on submission of Security Deposit (Refer Clause 3 of Section III). However, if the return of EMD is delayed for any reason, no interest/ penalty shall be payable to the bidder.

8.2 The successful bidder, on award of contract / order, must send the contract/ order acceptance in writing, within 10 days of award of contract/ order, failing which the EMD will be forfeited and the order will be canceled.

8.3 The EMD may be forfeited:

- If the bidder withdraws the bid during the period of bid validity specified in the bid.
- In case a successful bidder fails to furnish the Security Deposit (Refer Clause 3 of Section III).
- If the bidder fails to furnish the acceptance in writing, within 10 days of award of contract/ order.

9. Period of validity of bids

9.1. Bids shall be valid for a minimum of 120 days from the last date of bid submission. A bid valid for a shorter period shall stand rejected.

9.2. C-DAC may ask for the bidder's consent to extend the period of validity. Such request and the response shall be made in writing only. The bidder is free to not accept such a request without forfeiting the EMD/BG. A bidder agreeing to the request for extension will not be permitted to modify his bid.

10. Submission of Bids- Online PDF format only.

The Bid documents shall be neatly arranged and all pages should be numbered. They should not contain any terms and conditions, printed or otherwise, which are not applicable to the Bid. The conditional bid will be summarily rejected. Insertions, postscripts, additions and alterations shall not be recognized, unless confirmed by bidder's signature.

11. Bid Opening & Evaluation of Bids

The valid technical bids will be opened through the CPPP portal and evaluated in two steps.

11.1. The bids will be examined based on eligibility criteria stipulated at Para 4 of Section – II to shortlist the eligible bidders.

11.2. The technical bids of only the shortlisted eligible bidders shall be evaluated by employing the process as described in Section – III(A) and based on technical specifications stipulated at Section – IV.

11.3. The bidders whose technical bid is found to meet both the requirements as specified above will qualify for opening of the commercial bid and will be informed about the date and time of the opening of the commercial bid.

11.4. The duly constituted Tender Evaluation Committee (TEC) shall evaluate the bids. The TEC shall be empowered to take appropriate decisions on minor deviations, if any.

12. Comparison of Bids / Evaluation of Bids

12.1. For the purpose of selection, overall evaluation of the Proposals will be done in two stages i.e. Technical (comprising Pre-qualification Evaluation followed by Evaluation of Technical Proposal) and financial evaluation based on Quality and Cost Based Selection (QCBS).

12.2. Only the short-listed bids from the technical evaluation shall be considered for commercial comparison.

12.3. The final awarding of the contract will be done based on a Quality & Cost Based Selection (QCBS) procedure with 70% weightage towards Quality of Work (Evaluated by the Committee) and 30% weightage towards Commercial Bid.

Sl.no.	Parameters	Remarks	Weightage
1	Technical Bid	Will be fairly judged by the Committee on the basis of the process described in Section – III(A)	70%
2	Financial Bid	There should be fair and competitive pricing. The committee reserves the right to not select Vendor in case the price quoted irrationally or not in line with previous work orders submitted. Process detailed in Section – III(A)	30%

13.Award of Contract

13.1. C-DAC shall place the order(s) on the eligible bidder ranked highest based on the combined QCBS score as detailed in Section III (A). However, C-DAC reserves the right and has sole discretion to reject the lowest bid. CDAC reserves the right to renegotiate

any terms (Price / Technical) further with the successful Bidder.

13.2. If more than one bidder happens to quote the same lowest price in the financial bid, C-DAC reserves the right to place the order on the eligible bidder having larger sales turn-over for last financial year. The decision of C-DAC shall be final.

14.Purchaser's Right to amend / cancel

14.1. C-DAC reserves the right to amend the eligibility criteria, commercial terms & conditions, Scope of Supply, technical specifications etc. before bid closure date and provide sufficient time for the bidders to amend their bids accordingly.

14.2. C-DAC reserves the right to cancel the entire or partially bid without assigning any reasons thereof.

14.3. C-DAC reserves the right to reject the bid submitted by the lowest evaluated bidder.

15.Corrupt or Fraudulent Practices

15.1. It is expected that the bidders who wish to bid for this project have highest standards of ethics.

15.2. C-DAC will reject bid if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices while competing for this contract;

15.3. C-DAC may declare a vendor ineligible, either indefinitely or for a stated duration, to be awarded a contract if it at any time determines that the vendor has engaged in corrupt and fraudulent practices during the award / execution of contract.

16.Interpretation of the clauses in the Bid Document/Contract Document

In case of any ambiguity/ dispute in the interpretation of any of the clauses in this Bid Document, the interpretation of the clauses by Director General, C-DAC shall be final and binding on all parties.

17.Penalties

C-DAC reserves the right to levy penalties, as given below.

Sl. No.	Parameters	Penalty
A	Penalty for Delayed Delivery of project	0.5% of order value per week for delay in delivery of complete site in all respect, beyond schedule of 9 months. If the delay is more than 10 weeks, C-DAC reserves the right to cancel the Contract/ Order or execute the order at the cost of the bidder. Any delay because of C-DAC, or works contractor, conditions arising out of Force Majeure will not be considered while calculating the delay period for penalties. The maximum penalty levied shall be 5 % of the total order value.

18. Force Majeure

C-DAC may consider relaxing the penalty and delivery requirements, as specified in this document, if and to the extent that, the delay in performance or other failure to perform its obligations under the contract is the result of an Force Majeure. Force Majeure is defined as an event of effect that cannot reasonably be anticipated such as acts of God (like earthquakes, floods, storms etc.), acts of states / state agencies, the direct and indirect consequences of wars (declared or undeclared), Pandemic, hostilities, national emergencies, civil commotion and strikes at successful Bidder's premises or any other act beyond control of the bidder.

19. Arbitration

In case any dispute arises between the C-DAC and successful bidder with respect to this RFP, including its interpretation, implementation or alleged material breach of any of its provisions both the Parties hereto shall endeavour to settle such dispute amicably. If the Parties fail to bring about an amicable settlement within a period of 30 (thirty) days, dispute shall be referred to the sole arbitrator mutually appointed by both the parties. If the sole arbitrator is not appointed mutually by both the parties then the District Court Bengaluru shall have exclusive jurisdiction for appointment of sole arbitrator through court. Arbitration proceedings shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 and Rules made there under, or any legislative amendment or modification made thereto. The venue of the arbitration shall be Bengaluru.

The language of arbitration shall be English. The common cost of the arbitration proceedings shall initially be borne equally by the Parties and finally by the Party against whom the award is passed. Any other costs or expenses incurred by a Party in relation to the arbitration proceedings shall ultimately be borne by the Party as the arbitrator may decide. Courts in Bengaluru only shall have the exclusive jurisdiction to try, entertain and decide the matters which are not covered under the Arbitration and conciliation Act.

20. Indemnity

The successful bidder shall indemnify, protect and save C-DAC from/against all claims, losses, costs, damages, expenses, action suits and other proceeding, resulting from/arising out of:

- Infringement of any law pertaining to intellectual property, patent, trademarks, copyrights etc. by the bidder or
- Such other statutory infringements in respect of all the equipment's supplied by successful bidder, or

- Caused due to any act/omission/performance/under or non or part performance/failure of the bidder.

21. Assignment

Selected bidder/ Party shall not assign, delegate or otherwise deal with any of its rights or obligation to other parties under this Contract, without prior approval of C-DAC.

22. Severability

If any provision of this Contract is determined to be invalid or unenforceable, it will be deemed to be modified to the minimum extent necessary to be valid and enforceable. If it cannot be so modified, it will be deleted and the deletion will not affect the validity or enforceability of any other provision.

23. Termination

In case of the delays in providing the stipulated services, and /or defect/delay/under or non- performance pertaining to the services / products supplied by the bidder, C-DAC will give written notice to the bidder directing to set the things right within 30 days of notice. If bidder fails to comply with the requirements, C-DAC shall have the right to terminate the contract and / or cancel the order/s. The successful bidder agrees and accepts that he shall be liable to pay damages claimed by C-DAC, in the event of termination of contract / cancellation of order, as detailed in this RFP. The successful bidder may terminate the contract by at least 30 days' written notice, only in the event of non-payment of undisputed invoices for 90 days from the due date. Except this situation, the successful bidder shall have no right of termination.

C-DAC will release the due amount payable to successful bidder towards the material and / or services provided till the date of termination, those are accepted by C-DAC. However, the amount towards penalty, if any will be deducted from the payable amounts."
C-DAC reserves the right to terminate the contract / cancel order with or without cause/ reason, by giving 90 days' notice to the successful bidder.
In the event of termination of Contract, the Consultants have to furnish to C-DAC all the design, drawings, data, documents and details pertaining to this project, as exist with him till that date.

24. Notices

- Any notice, request or consent required or permitted to be given or made pursuant to this contract shall be in writing and shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail, telex, telegram or facsimile to such Party at the address specified in the contract.
- Notice will deem to be effective as specified in the contract.

25. Authorized Representatives

Any action required or permitted to be taken, and any document required or permitted to be executed, under this bid/Agreement by the C-DAC or the Consultant may be taken or executed by the officials specified in the contract.

For C-DAC: mmg-blrkp@cdac.in

For the Consultant: (Enclose Authorization by Authorized Signatory of the Consultancy Agency)

26. Limitation of Liability

The liability of the Bidder / Contractor arising out of breach of any terms/conditions of the bid/contract/work order and addendums/amendments thereto, misconduct, wilful default will be limited to the total contract value. However, liability of the bidder in case of death/injury/damage caused to the personnel/property due to/arising out of/incidental to any act/omission/default/deficiency of bidder/contractor will be at actual. In no event shall Party, its officers, directors, or employees be liable for any form of incidental, consequential, indirect, and special or punitive damages of any kind.

27. Confidentiality

The Consultant, his Sub-consultants and the Personnel of either of them shall not disclose any information and data furnished to him by C-DAC to any third party nor shall disclose any drawings, reports, specification, manuals and other information developed and prepared for C-DAC by the Consultant and his Sub-consultants and the Personnel of either of them, without prior written approval of C-DAC.

28. Suspension of Services

C-DAC may, by written notice of suspension to the Consultant, suspend all payments to the Consultant there under if the Consultant fails to perform any of their obligations under this Contract, including the carrying out of the Services, provided that such notice of suspension

- shall specify the nature of the failure, and
- shall request the Consultant to remedy such failure with in a stipulated period not exceeding thirty (30) days after receipt by the Consultant of such notice of suspension.

29. Foreclosure of the Contract

It shall be within the authority of C-DAC , at any time after acceptance of the bid or during the execution of the work, to foreclose or reduce the scope of the work, for any reasons whatsoever, either partly or wholly by giving the written notice not less than 15 days to the Consultant. In such an event, the Consultant shall have not claim whatsoever on account of any profits (s) or advantage(s) which the Consultant might have derived

from the execution of work in full but for the reasons of the foreclosure of the whole or part of the work. However, the Consultant shall be paid at the contract rates for the Services performed by him and the amount certified by the C-DAC.

30. Abandonment of Work

In case, the work is abandoned by the Consultant, without good and sufficient justification C-DAC is at liberty to encash the Performance Guarantee and impound any other amounts due to the consultant at the time of abandonment on account of this contract and engage another agency to complete the balance work without prejudice to any remedies available under this contract of Indian Law.

(END OF SECTION II)

SECTION III: SPECIAL CONDITIONS OF CONTRACT (SCC)

1. Prices

1.1. The price quoted shall be considered firm and no price escalation will be permitted (except Govt. Statutory Levies).

1.2. The bidder may quote in INR

1.3. Bidder must indicate applicable taxes separately for each item. The bidder should exercise utmost care to quote the correct percentage of applicable taxes on each item.

1.4. In case due to any error/ oversight, the GST rate quoted by the bidder is different than the GST rate as per the tariff, the bidder will not be permitted to rectify the error/oversight. The orders/ contract will be placed with the GST rate quoted by the bidder or actual tariff rate (as on placement of order), whichever is LOWER. The difference amount payable, if any, between the quoted GST rate and actual tariff rate shall be borne by the bidder.

1.5. The prices quoted must be F.O.R./D.D.P. till destination, C-DAC, Bengaluru/Bengaluru including of freight, insurance, forwarding, loading/un-loading and all incidental charges etc.,

1.6. The exact rate of taxes, charges currently applicable must be mentioned in the "commercial bid format". The statutory taxes applicable at the time of supply of material shall be applicable.

1.7. The responsibility, cost and risk of the consignment shall rest with the bidder till receipt of goods is acknowledged by the end user at C-DAC, Bengaluru/Bengaluru. However, such receipt/ acknowledgement shall not be treated as acceptance of goods.

2. Software Licenses: (if applicable)

The software licenses, if any, shall be required in the name of C-DAC, Bengaluru/Bangalore. The licenses shall contain paper/electronic licenses (wherever applicable).

3. Security Deposit (SD)

The successful bidder will be required to furnish the Security Deposit in INR equivalent to 5% of the order value within 10 days of receipt of Supply Order. The Security Deposit should be submitted in the form of Demand Draft/Bank Guarantee drawn in favour of C-DAC payable at Bengaluru. The Security Deposit will be valid for the period till completion of installation and commissioning and will be returned upon completion of installation & commissioning of entire system and on submission of Performance Bank Guarantee (PBG).

4. Performance Bank Guarantee (PBG)

The successful bidder will be required to furnish the Performance Guarantee towards

the supplies etc. supplied, in the form of a Bank Guarantee in INR equivalent to 10% amount of the total order value, as per the format attached to this document (**Annexure – A**). This bank guarantee should be submitted along with the invoice after successful installation within 15 days. The Bank Guarantee shall remain valid for the period of 38 months from the date of acceptance. The PBG must be negotiable at a branch of issuing bank in India. In case of no warranty/services claims towards the items under warranty and services during the validity period of bank guarantee, the PBG will be returned on completion of warranty period.

C-DAC reserves the right to invoke the Performance Bank Guarantee(s) submitted by bidder, in case of the following:

a. The Components/solutions of Superconducting based quantum facility including, Quantum Processor, Dilution Refrigerator, Control Electronics, Gas handling system, software stack, fail to achieve the performance as stipulated in this document (or)
b. The bidder fails to provide the warranty and other services in scheduled time frame, as stipulated in this document (or)
c. The bidder delays to provide the warranty services as stipulated in this document.

5. Completeness Responsibility

Notwithstanding the scope of work, engineering, supply and services stated in bid document, any equipment or material, engineering or technical services which might not be even specifically mentioned under the scope of supply of the bidder and which are not expressly excluded there from but which – in view of the bidder - are necessary for the performance of the equipment in accordance with the specifications are treated to be included in the bid and has to be performed by bidder.

The items which are over & above the scope of supply specified in the Schedule of Requirements may be marked as “Optional Items”.

6. Warranty and Support

The Supplier warrants that all the Goods are new, unused, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the order. The supplier further warrants that all Goods supplied shall have no defect arising from design, materials or workmanship (except when the design and/or material is required by the Purchaser’s specifications) or from any act or omission of the supplier.

Comprehensive onsite support and maintenance:

The support and maintenance should be comprehensive on site, repair/replacement basis free of cost for **minimum of 3 years**, from the date of acceptance of the solution. If during the aforesaid period, the Goods or the integrated system be discovered not to conform to the description and quality aforesaid or have deteriorated, Purchaser will be entitled to reject the Goods or such portion of the integrated system thereof as may be

discovered not to conform to the said description and quality. On such rejection, the Goods will be at the supplier's risk and all the provisions herein contained relating to rejection of Goods or such portion of the integrated system, shall apply. The supplier if called upon to do so, shall replace within one month or such further period as may be extended by the Purchaser on his discretion on an application made thereof by the supplier the goods or such portion thereof as is rejected by Purchaser and in such an event the above mentioned period shall apply to the Goods replaced from the date of acceptance of the replacement otherwise , the supplier shall pay to the Purchaser such damages as may arise by reason of breach of the conditions therein contained.

All the Goods supplied and the integrated system must have 24x7 support along with 8 hours response time and 72 hours resolution time, covering all parts & labor starting from the date after the successful installation, demonstration of performances and acceptance by C-DAC, Bengaluru. During the comprehensive maintenance period, supplier will have to undertake comprehensive maintenance of the entire hardware components, equipment, support and accessories supplied at the place of installation of the equipment.

Warranty of Goods supplied:

The **supplier also warrants** that the said goods and the integrated system would continue to conform to the description and quality aforesaid for a period of **minimum of 3 years** (extendable to additional 2 years) from the date of acceptance by the end user and that notwithstanding the facts that the Purchaser/ end user (Inspector) may have inspected and/or approved the said Goods.

For the Dilution refrigerator and associated items requested in Section IV – 1.2, the bidder shall arrange an SLA with an Indian supplier / entity and C-DAC, to ensure seamless operations of the systems and reduction in response times to failure.

The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. Goods requiring warranty replacements must be replaced on free of cost basis.

The warranty support will be backed by supplier by submitting a Performance Bank Guarantee, as per para 4 of Section – III.

7. Acceptance Criteria

Addition to scope of work defined in each part of Section IV, Bidder need to demonstrate the below parameters:

7.1. QPU Performance parameters:

7.1.1. Median Single-Qubit Gate Fidelity: ≥ 99.7%
7.1.2. Median Two-Qubit Gate Fidelity: ≥ 99%
7.1.3. Single-Qubit Gate Duration: ≤ 50 ns
7.1.4. Two-Qubit Gate Duration: ≤ 100 ns
7.1.5. Median Readout Fidelity: ≥ 97%

7.1.6. Median T1 time: ≥ 30 micro secs
7.1.7. Median T2 time: ≥ 20 micro secs

7.2. Fully functional Dilution Refrigerator parameters

7.2.1. Full capacity DR wiring, and DC Wiring for supporting the qubits offered and further scalable to 250 qubits.
7.2.2. Guaranteed Base Temperature <10 mK
7.2.3. Cooling power at 100 mK >=850 uW
7.2.4. Plate Diameter >= 500 mm

7.3. Control Electronics Parameters

7.3.1. Provided solution for supporting the qubits offered and further scalable to 250 qubits
7.3.2. Frequency range: 0-10 GHz readout, control lines and flux lines for provided QPU.
7.3.3. Flux lines output: ~ +/- 2 Vpp in a 50 ohm load.
7.3.4. Control lines with an output upto 10 dBm, SFDR <- 40 dBc, phase noise <-110 dBc/Hz.
7.3.5. Readout lines with input power <-20 dBm and on card measurement result storage memory.
7.3.6. Relative Phase stability across multiple RF (3-8 GHz) output modules over 1 hr <2 deg.
7.3.7. Low latency feedback <400-600 ns.
7.3.8. Synchronization jitter of the order of picoseconds across multiple modules.
7.3.9. Open QASM complaint API and pulse level API access the control electronics solution.
7.3.10. Input Voltage and Frequency: Complying with Indian A/C Power specifications

7.4. Application benchmark
7.4.1. Demonstration of Quantum Volume of n or higher, utilizing all the delivered qubits (n) in the QPU
7.4.2. Demonstration of the Randomized Benchmarking test suite
7.4.3. Hybrid Classical – QC : Demonstration of QAOA application, utilizing all the delivered qubits in the QPU
7.4.4. Demonstration of Error Correction on the Qubits offered.

The results of acceptance tests shall be well documented and countersigned by the representatives of bidder, C-DAC.

The approved acceptance test reports must be submitted along with the invoices for claiming payments, wherever applicable.

8. Payments:

40% amount of the order value will be released upon the receipt of Dilution refrigerator at site with 30 days credit.

20% amount of the order value will be released on receipt of QPU and Control Electronics at site with 30 days credit.

30% amount of the order value will be released on successful demonstration and acceptance of the integrated system.

Balance 10% amount shall be released against submission of PBG, as per clause 4 of Section III given above. PBG must be submitted within 15 days from the date of acceptance report. Applicable TDS on GST will be deducted.

9. Bill to C-DAC, Bengaluru

Centre for Development of Advanced Computing (C-DAC) - Knowledge Park,
No. 1, Old Madras Road, Byappanahalli, BENGALURU 560038 INDIA

10. Jurisdiction

The disputes, legal matters, court matters, if any shall be subject to Bengaluru jurisdiction only.

11. Risk

All risks, responsibilities and liabilities thereof in all goods shall remain with selected bidder till successful installation and commissioning of the goods as specified in this document

(End of Section – III)

SECTION III (A): EVALUATION PROCESS

1. Evaluation of Technical Proposals

1.1. Technical Pre-Qualification

7.4.5. Only those bidders who qualify all Pre-Qualification/Minimum Eligibility Criteria requirements (as stipulated at Para 4 of Section – II) shall be qualified for technical bid evaluation.

7.4.6. The Tender Committee (TC) reserves the right to reject a Service in case the offered service does not match the technical requirements/ objectives specified in Technical Bid.

7.4.7. The technical bid shall first be reviewed for determining the Compliance of the Technical bids with the RFP terms and conditions, Minimum/ mandatory Technical requirements, and the scope of work as defined in this RFP.

7.4.8. Any bid found to be non-compliant to the mandatory Technical Requirements, RFP terms, conditions, and work scope shall be rejected and shall not be considered for further evaluation. Bids that are technically compliant would only be taken up for commercial evaluation.

7.4.9. Bidder is required to submit all the supporting documents as per the criteria mentioned in the RFP. However, Buyer reserves the right to summarily reject any bid which does not contain all the mandatory supporting document or may ask the bidder to resubmit documents, the decision of Buyer shall be final and binding in this regard.

7.4.10. A score would be given to each bidder by Tender Committee based on the scoring criteria as detailed in below.

7.4.11. Buyer reserves the right to disqualify any bidder based on any relevant criteria, and its decision is final.

7.4.12. The Bidder should submit documents as a documentary proof of Work Order / Contract Agreement and any document justifying the completion of the assignment from the client.

Technical Bids shall then be evaluated for the criteria detailed below. The Bidders should enclose documentary evidence for fulfilling the Evaluation Criteria. The technical committee will evaluate the bidders those who had qualified in the previous Minimum Eligibility criteria/Pre-Qualification Criteria.

1.2.Technical Evaluation Methodology

The technical bids will be evaluated based on Quality and Cost Based System (QCBS) method as explained below. The technical proposals will be evaluated on the basis of Applicant's experience, its understanding of the scope of delivery, proposed

methodology, proposed technical deliverables and Work Plan, and the proposed plan for support & training. Technical evaluation committee may seek presentations from the bidders to seek additional clarifications (if any) from the technical proposal. Applicants will be deemed qualified for the evaluation of their Financial Proposals only if they score 70 marks or more out of 100 in the Technical evaluation, as per the criteria outlined below. Applicants who have secured less than 70 marks shall be rejected. Further to the assignment of marks, the highest marks scored by any applicant is called the Maximum Technical Marks (MTM). With respect to this, the Technical Score (TS) of the Applicants will be computed as follows:

$$TS = 100 * (TM / MTM)$$

(TM = Technical Marks scored as per the below mentioned Technical Evaluation criteria for the proposal under consideration)

1.3. Technical Evaluation Criteria

The scoring criteria to be used for evaluation of Technical Proposal shall be as follows:

Sl. No.	**Evaluation Criteria**	**Details of Criteria: Allocation of Marks**		**Proof / Document to be attached**
1	**Bidder Profile**	**Max Marks: 12**	**Min. marks: 4**	
1.1	Annual Turnover and Net worth	**Turnover in INR**	**Marks**	
		More than [1000] Crore	6	Audited Financial statement
		> INR [700] Crore and <= INR [1000] Crore	4	
		> INR [500] Crore and <= INR [700] Crore	3	
		>= INR [300] Crore and <= INR [500] Crore	2	
		Else	0	
1.2	Project Experience	The Bidder shall have successfully executed at least two (2) installation and commissioning of superconducting qubits based quantum computing facilities having the usable capacity of min. 50 qubits, in last 3 years, as on Bid Submission Date. (Also please refer Section II – Criteria 4.9)		
		No. of installations	**Marks**	
		> 3 installations	6	Installation Certificate endorsed by the client
		3 installations	4	
		2 installations	2	
		Else	0	

2	**Technical proposal and presentation from the bidder**	**Max Marks: 28**	**Min. marks: 17**	
2.1	Technical proposal from the bidder: Approach & Methodology including Planning phase, resource mobilization, stakeholder engagement, implementation framework, execution phase, testing & validation, deployment & training and post-implementation support.	**Evaluation Parameter**	**Marks**	
		Conformity to SECTION IV: SCHEDULE OF REQUIREMENTS in the proposed solution	If provided 1 Mark, Else 0	Annexure G
		Methodology, tools and Technologies to monitor & maintain the SLAs and managing change requests	If provided 1 Mark, Else 0	Technical Project Proposal
		Proposed structure for: 1. Project Strategy 2. Project Management 3. Risk Management 4. Resource Plan 5. Project Governance Model	If provided 1 Marks, Else 0	
		Identification of major risks and suitable mitigation plans for each of identified risks.	If provided 1 Mark, Else 0	
		Proposed solution for design & development of SOPs and KPIs (list down all the SOPs & KPIs identified for the solution)	If provided 1 Marks, Else 0	
2.2	Proposed Resources for the Project Implementation (until Acceptance). All the proposed positions shall be onsite throughout the entire project implementation phase (until Acceptance). . Refer Subsection 2. Manpower deployment of SECTION III (A), for more details and expected qualifications of the deployed manpower and the associated scoring.	**Profile**	**Marks**	
		Project Manager (atleast 1)	Total marks from Subsection 2. Manpower deployment of SECTION III (A) to be entered here	Educational Qualification & Experience Certificates
		Technical Team with experience in handling the following subsystems: DR and associated services Control Electronics & Cabling QPU characterization, demonstration Quantum System and		

		Application Engineering		
2.3	Proposed plan for Support & training. Refer Subsection 2. Manpower deployment of SECTION III (A), for more details and expected qualifications of the deployed manpower.	**Proposed Activity**	**Marks**	
		On-site support post-acceptance from the client:		Educational Qualification & Experience Certificates
		: for > 5 years	5	
		: for >3 years and <5 years	Starting at 1.0 mark. Every additional month, 0.1 marks will be added	
		: for 3 years	1	
		Post installation operational training for all the subcomponents:		
		>= 120 hrs	2	Educational Qualification & Experience Certificates
		>= 80 hrs and < 120 hrs	1	
3	**System capacity metrics**	**Max Marks: 25**	**Min. marks: 9**	
3.1	No. of Qubits	**Parameter**	**Marks**	
		No. of fully functional qubits offered in the QPU, which conform to the minimum performance metrics as listed in Criteria 4.1 of this table.		
		> 100	10	Product Data sheet / Whitepaper detailing the Design / Prototype with highlights
		>= 90 & <= 100	7	
		>= 80 & < 90	6	
		>= 70 & < 80	5	
		>= 60 & < 70	4	
		>= 50 & < 60	3	
		< 50	0	

				pointing towards the proposed qubits
3.2	No. of Co-ax lines supported in DR	**Parameter**	**Marks**	
		>= 1000	4	Product Datasheet(s)
		> 800 and <1000	1	
		Else	0	
3.3	Scalability of the Control Hardware & Software. No. of qubits the control hardware and software can scale upto for control & readout.	**Parameter**	**Marks**	
		>=250	4	Product Datasheet(s)
		<250	1	
		Else	0	
3.4	High Density wiring solutions for QPU with each flexible cable supporting atleast 4 channels (with a total of atleast 16 channels)	**Parameter** **(No. Of cables supporting atleast 4 channels each)**	**Marks**	
		> 16	5	Product Data sheet / Whitepaper detailing the Design / Prototype with highlights pointing towards the proposed qubits
		= 16	3	
		Else	0	
3.5	Damping against vibration	Active & Passive damping DR	1	Product Data sheet(s)
4	**System Performance metrics**	**Max Marks: 23**	**Min. marks: 9**	
		Range for the Parameter	**Marks**	
4.1	Proposed QPU: Median Single-Qubit Gate Fidelity	>= 99.9%	2	Product Data sheet / Whitepaper detailing the
		>= 99.7% and <99.9%	1	

4.2	Proposed QPU: Average T1 Coherence Time in microseconds	>50	2	Design / Prototype with highlights pointing towards the proposed qubits
		>=30 and <=50	1	
4.3	Proposed QPU: Median Two-Qubit Gate Fidelity	>=99.5%	2	
		>=99% and <99.5%	1	
4.4	Proposed QPU: Median Readout fidelity	>=99%	2	
		>=97% and <99%	1	
4.5	Proposed QPU: Two-Qubit Gate Duration: in ns	<60	2	
		>60 and <=100	1	
4.6	Proposed QPU: Single-Qubit Gate Duration: in ns	<40	2	
		>40 and <= 50	1	
4.7	Proposed QPU: Average T2 Time in microseconds	>40	2	
		>=20 and <=40	1	
4.8	Tunable coupler based QPU architecture		If Yes, 1 mark	
			Else 0	
4.9	Proposed DR: Guaranteed base temperature	<6mK	4	Product Data sheet(s)
		>6mK to <8mK	2	
		>8mK to <10mK	1	
5.0	Proposed DR: Guaranteed cooling power at 100mK	> 1000uW	4	
		> 900uW and <= 1000uW	1	
		< 900uW	0	
5	**System Modularity**	**Max Marks: 18**	**Min. marks: 18**	
		Parameter	**Marks**	
5.1	Modularity of the proposed Control Electronics	Relative Phase stability across multiple RF (3-8 GHz) output modules over 1 hr <2 deg	1	Product Data sheet(s)

		The control electronics solution shall support 100 qubits and scalable upto atleast 250 qubits operation	2	
		Synchronization jitter of the order of ps across multiple modules and Low latency feedback <400-600 ns	1	
		TWPA pump lines integrable in the compact electronics rack	1	
		Direct FPGA access provision to implement decoding algorithms towards error correction.	1	
		Mixer calibration free operation	1	
		Onboard integrated DC coupling provision	1	
		API level access to Control hardware and software (Access to pulse sequences generated for QPU control & readout)	1	
		Automation platform / APIs for qubit characterization, tuning, optimization and scaling	1	
		API Access to transpiled and optimized circuits at the software level	1	
		Reconfigurable Control Hardware to support various qubit types: semiconductor spin, superconducting qubits	1	
5.2	HPC-QC Integration strategy	Integration with HPC facility and demonstration of a hybrid HPC-QC algorithm / application over the established facility with SLURM integration for workload balancing	2	Product Data sheet / Whitepaper detailing the Design / Prototype with highlights pointing towards the
		Support for primitives to enable hybrid HPC-QC	2	

		programming		proposed solution
5.3	Error Correction	Error Correction solutions on the Qubits offered	2	Product Data sheet / Whitepaper detailing the Design / Prototype with highlights pointing towards the proposed solution
6	**System - Non Core components**	**Max Marks: 8**	**Min. marks: 7**	
		Parameter	**Marks**	
6.1	IoT Infrastructure and Telemetry	Integrated Telemetry and Monitoring Systems(Cryostat to Control Electronics)	1	Product Data sheet(s)
		Predictive Maintenance Software and Tools, Real-Time Data Collection and Analysis Systems	1	
6.2	Physical and Cybersecurity	Access Control Systems & Surveillance Systems (CCTV, Motion Detectors)	1	Product Data sheet(s)
		Fire Suppression System	1	
6.3	EMI/EMC Compliance	Filtered Power Supplies	1	Product Data sheet(s)
		EMI Shielding	2	
7.0	**Technical Proposal Presentation**	**Max Marks: 10**	**Min. marks: 6**	
		The Bidder will need to exhibit functional and non-functional requirements through presentation to the Technical Evaluation Committee.		

8.0	**Evaluation of Co-development proposals submitted**	**Max Marks: 5**	**Min. marks: 0**	
		The Bidder will need to propose co-development projects, as detailed in Section I – 1.1.7		
9.0	**Handholding of the QPU Design, tools and access to QPU fabrication facility.**	**Max Marks: 4**	**Min. marks: 0**	
		Extending access to the QPU foundry for customizing the QPU	2	
		Training on planar design and fabrication of QPUs (atleast 100 hrs.)	2	

2. Manpower deployment

Selected Bidder shall deploy Manpower during implementation (until acceptance) and Operation & Maintenance phases (post acceptance). The deployed resource shall report to CDAC's Project In-charge and work closely with the Program Management Office of CDAC.

Following are the minimum resources required to be deployed in the Project implementation, until acceptance (Price should be quoted accordingly in commercial bid format), however the Selected Bidder may deploy additional resources based on the need of the Project and to meet the defined SLAs in this RFP:

Sl. No	**Criteria**	**Man-months required**	**On-site deployment**	**Minimum Qualification & Experience**
1	Project Manager	9	95%	MBA (IT)/M. Tech with 2 years experience in Project management
2	Technical Engineers of the team (comprising of atleast 4 members) with experience in handling the following subsystems:	20	85%	B. Tech / M.Tech (Full Time) with 2 years experience in

	- DR and associated services - Control Electronics & Cabling - QPU characterization, demonstration - Quantum System and Application Engineering			relevant areas

Following are the minimum resources required to be deployed in the Project support (post acceptance from CDAC)

Sl. No	Criteria	Man-months required	On-site deployment	Minimum Qualification & Experience
1	Support Engineer(s)	72	95%	B. Tech / M.Sc. (Full time) with 1 year minimum experience

Following are the minimum resources required to be deployed for delivering the Training (post acceptance from CDAC)

Sl. No	Criteria	Minimum No. of hours (On-site)	Minimum Qualification of the trainers
1	Training	80	Ph.D. (QPU design, charecterization etc.) M.Tech. (DR / Control Electronics)

Following are the evaluation criteria for the qualifications of the manpower deployed:

Sl. No	Evaluation Criteria	Details of Criteria: Allocation of Marks	
1	**Project Manager**		
1.1	Educational Qualification	**Qualification**	**Marks**
		MBA (IT)/M. Tech	1
		Else	0
1.2	Work experience in the capacity of Project Director/ Program Manager in	**Years**	**Marks**
		>=5 years	2

	Quantum Technology Implementation Projects	>=2 and <5 year	1
		Else	0
1.3	Project Management Certification	PMP or PRINCE 2 Certificate (Bidder to submit scanned copy of valid certificate in the name of the resource)	1
		Else	0
2	**Technical Engineers deployed in Project Implementation - DR and associated services**		
2.1	Educational Qualification	**Qualification**	**Marks**
		B. Tech / M.Tech (Full Time)	1
		Else	0
2.2	Work experience in related projects /services	Years	Marks
		>=5 years	1
		>=2 and <5 years	0.5
		Else	0
3	**Technical Engineers deployed in Project Implementation - Control Electronics & Cabling**		
3.1	Educational Qualification	**Qualification**	**Marks**
		B. Tech / M.Tech (Full Time)	1
		Else	0
3.2	Work experience in related projects /services	Years	Marks
		>=5 years	1
		>=2 and <5 years	0.5
		Else	0
4	**Technical Engineers deployed in Project Implementation - QPU characterization & demonstration**		
4.1	Educational Qualification	**Qualification**	**Marks**
		Ph.D.	1
		M Tech / M.Sc (2 Years Full Time)	0.5
		Else	0
4.2	Work experience in related technologies /services	**Years**	**Marks**

		>=5 years	1
		>=2 and <5 years	0.5
		Else	0
5	**Technical Engineers deployed in Project Implementation - Quantum System and Application Engineering**		
5.1	Educational Qualification	**Qualification**	**Marks**
		Ph.D.	1
		M Tech / M.Sc (2 Years Full Time)	0.5
		Else	0
5.2	Work experience in related technologies /services	**Years**	**Marks**
		>=5 years	1
		>=2 and <5 years	0.5
		Else	0
6	**Technical Trainers**		
6.1	Work experience in related technologies /services	**Years**	**Marks**
		>=5 years	2
		>=2 and <5 years	1
		Else	0
7	**Technical Engineers deployed in Project Support**		
7.1	Educational Qualification	**Qualification**	**Marks**
		Ph.D.	1
		B Tech / M.Sc (2 Years Full Time)	0.5
		Else	0
7.2	Work experience in related technologies /services	**Years**	**Marks**
		>=2 years	1
		>=1 and <2 years	0.5
		Else	0

3. Evaluation of Financial Proposals

In the second stage, the financial evaluation will be carried out as per the below clause. Each Financial Proposal will be assigned a financial score (FS) as specified below.

The cost indicated in the Financial Proposal shall be deemed as final and reflecting the total cost of services. Omissions, if any, in costing any item shall not entitle the bidder to be compensated and the liability to fulfill its obligations within the total quoted price, shall be that of the Bidder. The prices quoted by the bidders including taxes as per details given in the Price Bid format, will only be compared.

The Financial Proposal shall be evaluated based on the parameter of Rate per Full stack Qubit. A Full-stack qubit refers to a qubit that is part of a comprehensive quantum computing architecture where all the layers of the quantum computing stack—from hardware & subsystems to software—are optimized and integrated to enable robust and scalable quantum computation.

Bidders should use the following formula for arriving at the Rate per Full stack Qubit (F):

F = TC / N

where:

TC = Total financial bid for the entire system including NRE and all taxes and duties

N = Number of full stack qubits offered by the bidder in their proposal

The Financial Score (FS) will be calculated on the basis of Rate per full stack Qubit quoted by the bidders as given below:

FS = (Fmin/F) * 100

Where, F = Actual Rate per full stack Qubit quoted by the bidder,

Fmin = Lowest Rate per full stack Qubit, among the financial proposals under consideration.

4. Combined and Final Evaluation

4.1. The minimum qualifying marks for the parameters stipulated in technical evaluation above shall be 70. The bidders getting marks less than 70 will be disqualified.

4.2. Evaluators of technical proposals will not have access to the commercial bids until the technical evaluation is concluded. The folder containing the financial proposal will not be opened until the technical evaluation is complete.

4.3. Declaration of Technical Marks: The technical Marks of the bidders will be declared before the Financial Bid is opened and the score of only the qualified bidders of Technical evaluation will be considered for evaluation of bids as per QCBS system of Evaluation.

4.4. The Technical Score (TS) secured by each qualified bidder shall be informed to the bidders present during the commercial bids opening meeting. The date and venue of the commercial bids opening will be informed separately.

4.5. The Combined Technical and Financial Score (CTFS) with Weightage 70:30 (70 for technical and 30 for Financial) will be calculated.

4.6. The **Combined Technical and Financial Score (CTFS)** will only be taken for comparison of bids and for deciding bidder securing highest score. The CTFS score is calculated as follows:

CTFS = TS * 0.7 + FS * 0.3

4.7. The Selected Applicant shall be the Applicant having the highest combined score. The second highest Applicant shall be kept in reserve and may be invited in its discretion for negotiations in case the first-ranked Applicant withdraws, or fails to comply with any of the requirements specified in this document.

4.8. **An illustrative example** for calculating the CTFS, is given below:

Illustration of a typical QCBS process to be followed in evaluation of BIDS is given as under with an arbitrary example just to explain the process:

Stage 1	**Technical Evaluation**
Bidder Detail	**Technical Marks (TM) Obtained**
Bidder 1	92
Bidder 2	75
Bidder 3	65
Bidder 4	85

*Bidder3 will be disqualified as the total technical Mark is below 70.

Financial Bid of Bidder 3 will not be opened

Maximum Technical Marks (MTM) = 92

Stage 2	**Conversion of Technical Marks to Tech-**	**TS = (TM/MTM)**

	nical Score		* 100
Bidder details	**Technical Marks**	**Technical Score (TM/MTM) * 100**	**TS**
Bidder 1	92	(92/92)*100	100.00
Bidder 2	75	(75/92)*100	81.52
Bidder 3	Disqualified	Disqualified	Not Calculated
Bidder 4	85	(85/92)*100	92.39

Stage 3	**Financial Bid Evaluation**
Bidder details	**Rate per Full stack Qubit Bid Amount Including NRE and all taxes and duties**
Bidder 1	1,30,000
Bidder 2	1,20,000
Bidder 4	1,25,000

Fmin = 120000 (Lowest Rate per full stack Qubit among all the financial bids under consideration)

Stage 4	**Conversion of Financial Bid to Financial Score**		
Bidder Detail	Rate per Full stack Qubit Bid Amount	Bid Financial Score =Fmin/F*100	FS
Bidder 1	1,30,000	(120000/130000)*100	92.31
Bidder 2	1,20,000	(120000/120000)*100	100.00
Bidder 4	1,25,000	(120000/125000)*100	96.00
	F = Rate per full stack Qubit of the bid under consideration		

Consolidated Technical And Financial Scores		
Bidder details	**Technical Score (TS)**	**Financial Score (FS)**
Bidder 1	100	92.31
Bidder 2	81.52	100.00
Bidder 4	92.39	96.00

Stage 5	**Combined Technical & Financial Score (CTFS)**		
	Weightage:	Technical Weight Financial Weight	70% 30%
Bidder De-tail	**Applying weights for Technical & Financial Scores**	**CTFS**	**Final Rank**
Bidder 1	100 * 0.7 + 92.31 * 0.3	95.38	H1
Bidder 2	81.52 * 0.7 + 100 * 0.3	92.61	H3
Bidder 4	92.39 * 0.7 + 96 * 0.3	94.56	H2

(END OF SECTION III (A))

SECTION IV: SCHEDULE OF REQUIREMENTS

1. Detailed Specifications

1.1. Core Components

Superconducting Quantum Processing Unit (QPU)

- Qubits: in the range of 50 to 100 (in a single QPU)
- QPU Performance:
    - Median Single-Qubit Gate Fidelity: ≥ 99.7%
    - Median Two-Qubit Gate Fidelity: ≥ 99%
    - Single-Qubit Gate Duration: ≤ 50 ns
    - Two-Qubit Gate Duration: ≤ 100 ns
    - Median Readout Fidelity: ≥ 97%
    - Median T1 time: ≥ 30 micro secs
    - Median T2 time: ≥ 20 micro secs
- QPU Package, Enclosure, and Wiring: Fully integrable with cryogenic and control systems. Magnetic shielding as needed.
- Demonstration of a representative application utilizing all the delivered qubits in the QPU

Amplifiers

- Cryogenic electronics to support QPU performance including travelling wave parametric amplifiers (TWPA), HEMT amplifiers, isolators, circulators, attenuators etc. These shall be provided for supporting 100 qubits or more.

1.2. Fully functional Dilution Refrigerators and Cryogenic Systems

- Dilution Unit with full capacity cryogenic wiring for supporting the qubits offered and further scalable to 250 qubits.
- Full capacity DC wiring for supporting the qubits offered and further scalable to 250 qubits.
- Guaranteed Base Temperature- <10 mK
- Cooling power at 20 mK- >=25 uW
- Cooling power at 100 mK- >=850 uW
- Plate Diameter >=500 mm with additional sample space
- Modular wiring inserts
- Gas Handling System
- Passive and Active vibration dampening
- Liquid nitrogen trap, Oil-free, Cryogenic magnetic shield, Vacuum and magnetic shield, Warm up heaters

- System shall include relevant sub-components like vacuum turbo pump (if external needed), water chiller, gas leakage detector, compressed air supply unit, UPS etc.
- Oil-Free Pumps for System Operation
- Long-Life Cold Trap (≥ 1 year continuous operation)
- Integrated Nitrogen Heat Pipes for Fast Cool Down
- Automatic Recovery from Power Failure without Control Computer

Cryogenic System and Temperature Control

- Standalone Control Unit
- Temperature Controller

Radiation and Magnetic Shielding:

- Additional radiation and magnetic shield as required.

1.3. Control Electronics and Quantum Control System (QCS)

- The control electronics solution shall support the qubits offered and further scalable to 250 qubits.
- Compact control electronics portable rack mountable chassis to deliver QPU performance as mentioned in 1.1 of SECTION – IV.
- Plug and play module for readout, control lines and flux lines for provided QPU.
- Frequency range: 0-10 GHz readout, control lines and flux lines for provided QPU.
- Mixer calibration free operation.
- Flux lines output: ~ +/- 2 Vpp in a 50 ohm load.
- Integrated DC coupling as needed.
- Control lines with an output upto 10 dBm, SFDR <- 40 dBc, phase noise <-110 dBc/Hz.
- Readout lines with input power <-20 dBm and on card measurement result storage memory.
- Relative Phase stability across multiple RF (3-8 GHz) output modules over 1 hr <2 deg.
- Low latency feedback <400-600 ns.
- Synchronization jitter of the order of ps across multiple modules.
- TWPA pump lines compact electronics possibly integrable in the compact electronics rack.
- Pulse sequence programming framework allowing for gate implementation with real-time phase, frequency and amplitude adjustment and complete control over the implementation flow.
- Control electronics software UI and editor for easy management and configuration of the control electronics.
- Open QASM complaint API and pulse level API access the control electronics

solution.

- Direct FPGA access provision to implement decoding algorithms towards error correction.
- Input Voltage and Frequency: Complying with Indian A/C Power specifications.
- Ambient operating temperature: 15 degrees to 40 degrees Celsius.
- Ethernet (1 Gbps) and serial connection.
- Control electronics calibration cycle ~ 2 years.

1.4. IT Hardware and Software

Host Server

- High-Performance Host Server for managing quantum operations.

Quantum Software:

- Full-Stack Quantum Software Environment:
  - Quantum Programming Environment
  - System Integration and Management Tools
- Automation Software for Qubit characterization, tuning, optimization, scaling and error correction
- Cloud based platform for user to access QPU with circuit composer and Python Interface with transpilation into control electronics instructions.

1.5. Networking and Power systems

Quantum Access Node

- Networking Equipment for integration with existing IT infrastructure.

Power Systems

- Reliable Power Conditioning Systems.
- Backup Power Solutions with UPS and Redundant Power Supplies.

1.6. Environmental Monitoring and Control, Physical and CyberSecurity

Monitoring Systems

- Environmental Monitoring Systems for temperature, humidity, and electromagnetic interference (EMI) if required.
- Systems should ensure optimal operating conditions for quantum hardware.

IoT Infrastructure and Telemetry

- Integrated Telemetry and Monitoring Systems
- IoT Sensors and Devices (for Cryostat to Control Electronics)
- Key Metrics Generation Tools
- Predictive Maintenance Software and Tools
- Real-Time Data Collection and Analysis Systems

Physical and Cybersecurity

- Access Control Systems
- Surveillance Systems (CCTV, Motion Detectors)
- Fire Suppression System

1.7. Documentation and Training:

Documentation

- Comprehensive Instruction Manuals and Datasheets for all hardware and software components.
- Drawings and Model Files for hardware.
- Detailed Wiring Schemes, Drawings, and Tables.
- System Management and Software Documentation.
- Design and architecture document of the QPU being offered
- Quantum Control Hardware – Detailed specification & operating ranges for different subcomponents

Training

- Training covering system operation and maintenance (for atleast 80 hrs.)
- Training on planar design and fabrication of QPUs (for atleast 100hrs.)
- Yearly Refresh Training for continued proficiency.
- Training Documentation provided in both digital and printed formats.

1.8. Service and Maintenance

Service Level Agreement (SLA)

- Comprehensive Onsite Support & Maintenance covering all hardware, software and integrated system for 3 years (post acceptance)
- Warranty of the goods supplied and integrated system for 3 years (Extendable to additional 2 years)

Maintenance Tools and Spare Parts

- Provision of 2 sets of maintenance tools and spare parts for routine upkeep and emergency repairs.

1.9. Integration Terms and Conditions

System Integration

- The bidder shall ensure that all components listed are fully integrated into a cohesive and operational 50 to 100 qubits superconducting quantum computer.
- The integration process must include comprehensive testing to verify system compatibility, performance, and reliability.

Interoperability

- All subsystems (QPU, dilution refrigerator, and control electronics and software stack) must be interoperable and capable of seamless operation under standard quantum computing workloads.
- Any required interface adapters, connectors, or software modules for interoperability shall be provided by the supplier.

Performance Validation

- The supplier shall perform an on-site performance validation of the integrated system, including the following:
  - QPU performance metrics (as specified in 1.1 of Section IV).
  - Dilution refrigerator base temperature (as specified in 1.2 of Section IV).
  - Control electronics functionality, including communication with the QPU and cryogenic systems (as specified in 1.3 of Section IV).
- On the integrated system, the following demonstrations to be carried out:
  - Quantum Volume of n or higher, utilizing all the delivered qubits (n) in the QPU
  - Demonstration of the Randomized Benchmarking test suite
  - Hybrid Classical – QC : Demonstration of QAOA application, utilizing all the delivered qubits in the QPU
- A final performance report detailing the results of all validation tests must be provided to the customer.

Documentation

- Comprehensive documentation must be provided, including but not limited to:
  - System architecture and design documents.
  - Detailed wiring diagrams and interface schematics.
  - User manuals for all hardware and software components.
  - Maintenance and troubleshooting guides.
  - Source code (if applicable) and configuration files for all software components.

Support & Service Level Agreement (SLA)

- The supplier shall provide comprehensive onsite support and maintenance covering all the components and integration services for a minimum of 3 years. It should include on-site support, remote diagnostics, and access to spare parts and maintenance services.
- The supplier shall provide warranty on the goods supplied for a minimum of 3 years (extendable to additional 2 years)
- The supplier shall provide a detailed SLA outlining response times, uptime guarantees, and penalties for non-compliance in the technical proposal submitted.
- The SLA must cover all components and the integrated system, ensuring continuous operation and prompt resolution of any issues.

Delivery and Installation

- The supplier is responsible for the safe delivery, installation, and setup of all components at the customer's facility.
- Installation must include all necessary infrastructure work, such as electrical wiring, networking, and cryogenic support systems.

Acceptance Testing

- After installation, the supplier must conduct acceptance testing in the presence of customer representatives.
- Acceptance testing should validate the full functionality and performance of the integrated system according to the specifications.

Change Management

- Any changes to the system design, components, or integration process must be documented and approved by the customer prior to implementation.
- The supplier shall provide impact assessments for any proposed changes, including potential effects on performance, interoperability, and delivery timelines.

(END OF SECTION IV)

SECTION- V: PRICE BID

KINDLY FILL ALL THE DETAILS CAREFULLY FOR THE PARTS YOU WISH TO BID

1. Superconducting Quantum Computer Components

Item No.	Description	Qty	Unit	Unit Price	BASIC RATE In Figures To be entered by the Bidder (In INR)	GST (in %)	Total Price(in INR)
1.1	**Qubit Processing Unit (QPU)**						
1.1.1	Superconducting Quantum Processing Unit (50 to 100 qubits) with microwave package						
1.1.2	Travelling Wave Parametric Amplifier (TWPA)						
1.1.3	Other cryogenic component sets						
1.2	**Fully functional Dilution Refrigerator**						
1.2.1	Dilution Refrigerator for supporting the qubits offered and further scalable to 250 qubits with needed support systems and components						
1.2.2	Full capacity DR wiring for supporting the qubits offered and further scalable to 250 qubits.						
1.3	**Control Electronics and Peripherals**						
1.3.1	Control Electronics for supporting the qubits offered and further scalable to 250 qubits with wiring and sub components as required						
1.4	**Networking Equipment and IT Infrastructure**						
1.4.1	High-Speed Networking Infrastructure						
1.4.2	Quantum-Specific Networking Hardware						
1.4.3	Secure Data Storage Solutions						
1.4.4	Networking Equipment for IoT Integration						

Item No.	Description	Qty	Unit	Unit Price	BASIC RATE In Figures To be entered by the Bidder (In INR)	GST (in %)	Total Price(in INR)
1.5	**IoT Infrastructure and Telemetry**						
1.5.1	Integrated Telemetry and Monitoring Systems						
1.5.2	IoT Sensors and Devices (Cryostat to Control Electronics)						
1.5.3	Key Metrics Generation Tools						
1.5.4	Predictive Maintenance Software and Tools						
1.5.5	Real-Time Data Collection and Analysis Systems						
1.6	**EMI/EMC Compliance**						
1.6.1	EMI Shielding and Grounding Solutions						
1.6.2	EMC Testing and Certification						
1.6.4	Filtered Power Supplies						

2. Installation and Integration

Item No.	Description	Qty	Unit	Unit Price	BASIC RATE In Figures To be entered by the Bidder (In INR)	GST (in %)	Total Price(in INR)
2.1	**Installation and Integration Services**						
2.1.1	System Installation and Setup						
2.1.2	Training for Operation and Maintenance						
2.1.3	Training on planar design and fabrication of QPUs						
2.1.4	Documentation and Knowledge Transfer						

3. Maintenance and Support

Item No.	Description	Qty	Unit	Unit Price	BASIC RATE In Figures To be entered by the Bidder (In INR)	GST (in %)	Total Price(in INR)
3.1	**Service and Support**						
3.1.1	Comprehensive Onsite Support and Maintenance for atleast 3 years						
3.1.2	Maintenance Tools and Spare Parts						

4. Additional Costs

Item No.	Description		Total Price(in INR)
4.1	**Miscellaneous Costs**		
4.1.1	Shipping and Handling		
4.1.2	Customs and Duties		
4.1.3	Installation Tools and Equipment		

5. Summary

Description	Total Price(in INR)
Total for QPU Components	
Total for Dilution Refrigerators	
Total for Control Electronics and Peripherals	
Total for Networking and IT Infrastructure	
Total for IoT Infrastructure and Telemetry	
Total for EMI/EMC Compliance	
Total for Installation and Integration Services	
Total for Maintenance and Support	
Total for Additional Costs	
Grand Total (TC)	

Description	Total Price(in INR)
Rate per Full Stack Qubit*	

*Rate per Full Stack Qubit to be calculated as follows:
Rate per Full Stack Qubit = TC / N
where:
TC = Total financial bid for the entire system including NRE and all taxes and duties
N = Number of full stack qubits offered by the bidder in their proposal

NOTES:

- The prices quoted above must be 'all-inclusive' till destination, i.e. C-DAC, Bengaluru.
- C-DAC reserves the rights to place order.

(END OF SECTION – V)

ANNEXURE A – COVERING LETTER

Date:

To:

The Director General,
Centre for Development of Advanced Computing (C-DAC)
Knowledge Park, No. 1, Old Madras Road, Baiyppanahalli,
Bengaluru - 560038 Karnataka, INDIA

Subject: Submission of bid for Supply and installation of Superconducting Qubit based Quantum Computing Facility.

Dear Sir,

We, the undersigned, offer for Supply and installation of Superconducting Qubit based Quantum Computing Facility to C-DAC, in response to your tender no. CDACB/RD24/094 dated 1.1.2025, We are hereby submitting our proposal for same, which includes Technical bid and the Financial Bid on www.eprocure.gov.in

We hereby declare that all the information and statements made in this bid are true and we accept that any misinterpretation contained in it, may lead to our disqualification.

We undertake, if our proposal is accepted, to submit a Security Deposit of 5 % of the contract / order value, as per terms stipulated in the bid.

We hereby certify that my/ our firm has not been disqualified and / or blacklisted by any Office/ Department/ Undertaking of the State Government / Central Govt. of India, PSU/ Autonomous Body of Government of India, at the time of submission of this bid.

We agree to abide by all the terms and conditions of the bid document, including corrigenda. We would hold the terms of our bid valid for 120 days as stipulated in the bid document.

We understand you are not bound to accept any Proposal you receive.

The undersigned is authorized to sign this bid document. The authority letter to this effect is enclosed.

Yours sincerely,

Authorized Signatory:
Name and Title of Signatory: e-mail:
Mobile No:

ANNEXURE B – AUTHORITY LETTER

Date:

To:

The Director General,
Centre for Development of Advanced Computing (C-DAC)
Knowledge Park, No. 1, Old Madras Road, Baiyppanahalli,
Bengaluru - 560038 Karnataka, INDIA

Subject: **Authority Letter**

Reference: **Tender no. CDACB/RD24/094**

Dear Sir,

We, M/s _____(Name of the bidder)_____ having registered office at _____(Address of the bidder)_____ herewith submit our bid against the said bid document.

Mr./Ms. _____(Name and designation of the signatory)_____, whose signature is appended below, is authorized to sign and submit the bid documents on our behalf against said RFP.

Specimen Signature:

The undersigned is authorised to issue such authorisation on behalf of us.

For M/s _____(Name of the bidder)

Signature and company seal

Name
Designation
Email
Mobile No.

ANNEXURE C – UNDERTAKING(S) BY PRINCIPAL MANUFACTURER/OEM

(To be submitted in Original on Letterhead-For Quantum Processing Unit, Dilution Refrigerator, Control Electronics components separately)

Date:

The Director General,
Centre for Development of Advanced Computing (C-DAC)
Knowledge Park, No. 1, Old Madras Road, Baiyppanahalli,
Bengaluru - 560038 Karnataka, INDIA

Subject: Undertaking by Principal Manufacturer against **Tender no. CDACB/RD24/094** for Supply, Installation & Commissioning of **Superconducting Qubits based Quantum Computing Facility at C-DAC, Bengaluru.**

Dear Sir,

We, M/s _____*(Name of the manufacturer)*_____having registered office at _____*(address of the manufacturer)*_____ by virtue of being manufacturer for _____*(Name of the product/s)*_____, hereby certify that M/s ____*(Name of the bidder)*_____having their office at ____*(Address of bidder)*_____are our Authorized System Integrator for our range of products quoted by them, as listed below:

1. Superconducting based Quantum Processing Unit
2. Dilution Refrigerator
3. Control electronics

Within the scope of requirement as per the bid mentioned above, we undertake to provide technical & other support towards fulfilling the requirements of installation, commissioning, benchmarking, acceptance criteria and product warranty services of the components to be supplied and installed at C-DAC, site by M/s._____(Name of bidder)_____ against said bid.

We also certify that the products offered are not nearing end-of-life / end-of-support five years down the line from the date of bidding.

The undersigned is authorized to issue this certificate on behalf of M/s____*(Name of the manufacturer)*.

For M/s _____*(Name of the manufacturer)*

Signature & company seal

Name
Designation
Email
Mobile No.

ANNEXURE D – PROFORMA OF BANK GUARANTEE
(on non-judicial paper of appropriate value)

To,

Centre for Development of Advanced Computing, Knowledge Park,
No.1, Old Madras Road, Baiyappanahalli, Bengaluru – 560038

BANKS GUARANTEE NO:

DATE:

Dear Sir(S)

This has reference to the Purchase Order No. _____ Dated _____ been placed by Centre for Development of Advanced Computing(C-DAC), Bengaluru on M/s_____ (Name & Address of vendor) for supply, installation, commissioning and warranty of (description of items) at C-DAC, site.

The conditions of this order provide that the vendor shall,

1. Arrange to deliver the items listed in the said order to the consignee, as per details given in said order, and
2. Arrange to install and commission the items listed in said order at client's site, to the entire satisfaction of C-DAC and
3. Arrange for the comprehensive warranty service support towards the items supplied by vendor on site as per the warranty clause in said purchase order.

M/s _____(Name of Vendor)_____ has accepted the said purchase order with the terms and conditions stipulated therein and have agreed to issue the performance bank guarantee on their part, towards promises and assurance of their contractual obligations vide the Supply Order No. M/s. _____(name of vendor)_____ holds an account with us and has approached us and at their request and in consideration of the promises, we hereby furnish such guarantees as mentioned hereinafter.

C-DAC shall be at liberty without reference to the Bank and without affecting the full liability of the Bank hereunder to take any other undertaking of security in respect of the bidders obligations and / or liabilities under or in connection with the said contract or to vary the terms vis-a – vis the bidder or the said contract or to grant time and or indulgence to the bidder or to reduce or to increase or otherwise vary the prices or the total contract value or to forebear from enforcement of all or any of the obligations of the bidder under the said contract and/or the remedies of C-DAC under any security now, or hereafter held by C-DAC and no such dealing(s) with the bidder or release or forbearance whatsoever shall have the effect of releasing the bank from its full liability of C-DAC hereunder or of prejudicing right of C-DAC against the bank.

This undertaking guarantee shall be a continuing undertaking guarantee and shall remain valid and irrevocable for all claims of C-DAC and liabilities of the supplier arising up to and until ____

(date) _____.

This undertaking guarantee shall be in addition to any other undertaking or guarantee or security whatsoever the that C-DAC may now or at any time have in relation to its claims or the supplier's obligations/liabilities under and / or in connection with the said contract and C-DAC shall have the full authority to take recourse to or enforce this undertaking guarantee in preference to the other undertaking or security (ies) at its sole discretion and no failure on the part of C-DAC in enforcing or requiring enforcement of any other undertaking or security shall have the effect of releasing the bank from its full liability hereunder.

We _____(Name of Bank)_____ hereby agree and irrevocably undertake and promise that if in your (C-DAC's) opinion any default is made by M/s _____(Name of Vendor)_____ in performing any of the terms and /or conditions of the agreement or if in your opinion they commit any breach of the contract or there is any demand by you against M/s ___(Name of Vendor)___, then on notice to us by you, we shall on demand and without demur and without reference to M/s _____(Name of Vendor)_____, pay you, in any manner in which you may direct, the amount of Rs. ___/- (Rupees _____ Only) or such portion thereof as may be demanded by you not exceeding the said sum and as you may from time to time require. Our liability to pay is not dependent or conditional on your proceeding against M/s (Name of Vendor) and we shall be liable & obligated to pay the aforesaid amount as and when demanded by you merely on an intimation being given by you and even before any legal proceedings, if any, are taken against M/s _____(Name of Vendor)_____The Bank hereby waives all rights at any time inconsistent with the terms of this undertaking guarantee and the obligations of the bank in terms hereof shall not be anywise affected or suspended by reason of any dispute or disputes having been raised by the supplier (whether or not pending before any arbitrator, Tribunal or Court) or any denial of liability by the supplier or any order or any order or communication whatsoever by the supplier stopping or preventing or purporting to stop or prevent payment by the Bank to C-DAC hereunder.

The amount stated in any notice of demand addressed by C-DAC to the Bank as claimed by C-DAC from the supplier or as suffered or incurred by C-DAC on the account of any losses or damages or costs, charges and/or expenses shall as between the Bank and C-DAC be conclusive of the amount so claimed or liable to be paid to C-DAC or suffered or incurred by C-DAC, as the case may be and payable by the Bank to C-DAC in terms hereof.

You (C-DAC's) shall full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the contact with the said M/s _____(Name of Vendor)_____ and to enforce or to forbear from endorsing any power or rights or by reason of time being given to the said M/s __(name of Vendor)__ which under law relating to the sureties would but for the provisions have the effect of releasing us.

You will have full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the contract with the said M/s___(Name of Vendor)___ and to enforce or to forbear from endorsing any power or rights or by reason of time being given to the said M/s __(Name of Vendor)____ which under law relating to the sureties would but for the provisions have the effect of releasing us.

Your right to recover the said sum of Rs. _____/- (Rupees _____ Only) from us in manner aforesaid will not be affected/ or suspended by reason of the fact that any dispute or disputes have been raised the said M/s (Name of Vendor) and/ or that any dispute or disputes are pending before any officer, tribunal or court or Arbitrator.

The guarantee herein contained shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the said M/s _____ (Name of Vendor) but shall in all respects and for all purposes be binding and operative until payment of all dues to C-DAC in respect of such liability or liabilities.

Our liability under this guarantee is restricted to Rs._____/- (Rupees _____ Only). Our guarantee shall remain in force until unless a suit action to enforce a claim under guarantee is filed against us within six months from (which is date of expiry of guarantee) all your rights under the said guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there under.

We have power to issue this guarantee in your favor under Memorandum and Articles of Association of our Bank and the undersigned has full power to do under the power of Attorney dated.

Notwithstanding anything contained herein:

A. Our liability under this guarantee shall not exceed Rs _____ (in words)

B. This bank guarantee shall be valid up to (date) & unless a suit for action to enforce a claim under guarantee is filed against us within 1 month from the date of expiry of guarantee. All your rights under the said guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there after i.e. after one month from the date of expiry of this Bank guarantee

C. We are liable to pay the guaranteed amount or any parts thereof under this bank guarantee only and only if you serve upon us a written claim or demand or before

D. The Bank guarantee will expire on (Min 37 months from the date of successful installations of the items in the order)

Granted by the Bank

Yours faithfully, For (Name of Bank)

SEAL OF THE BANK

Authorised Signatory

ANNEXURE E – BID ACCEPTANCE LETTER

(To be submitted on Company Letter Head).

Date:

To:

Centre for Development of Advanced Computing
Knowledge Park, No. 1, Old Madras Road,
Baiyppanahalli, BENGALURU 560038.

Subject: Bid Acceptance Letter

Reference: **Tender no. CDACB/RD24/094**

Dear Sir,

1. I / We have downloaded / obtained the bid document(s) for the above mentioned `Bid' from the web site(s) namely: www.cdac.in / www.eprocure.gov.in etc.; as per your NIT, given in the above-mentioned website(s).
2. I / We hereby certify that I / We have read the entire terms and conditions of the bid documents from Page No.1 to 71 (including all documents like annexure(s), schedules(s), etc.), which form part of the contract agreement and I / We shall abide hereby by the terms / conditions/ clauses contained therein.
3. The corrigendum(s) issued from time to time by your department / organization too has also been taken into consideration, while submitting this acceptance letter.
4. I / We hereby unconditionally accept the bid conditions of above mentioned bid document(s) / corrigendum(s) in its totality / entirety.
5. I / We certify that all information furnished by the our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organization shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the fully said earnest money deposit absolutely.

Yours Faithfully,

Authorized Signatory.

(Signature of the Bidder, with Official Seal) Email id for correspondence.

ANNEXURE F - INTEGRITY PACT

(To be executed on plain paper)

This Integrity Pact ("the Pact") is made and executed on this _____ Day of _____ Two Thousand Twenty _____ at _____.

By and Between

Centre for Development of Advanced Computing (C-DAC), an autonomous scientific Society under the Ministry of Electronics and Information Technology, Government of India, registered under the Societies Registration Act 1860 and the Bombay Public Trusts Act 1950, having its registered Office at Savitribai Phule Pune University Campus, Pune 411 007, hereinafter referred to as "C-DAC/Principal", which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its administrators, successors or assignees, as the case may be.

and

…… hereinafter referred to as "The Bidder(s)/Contractor(s)", which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its administrators, successors or assignees, as the case may be.

(The Principal and the Bidder (s)/Contractor(s) are collectively referred to as "the Parties".

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for ---------- ("the Contract"). The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s. The Principal intends to avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into. The Principal also intends that Bidder/s and Contractor/s should abstain from bribing or indulging in any corrupt practices in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the Bidder/s and Contractor/s shall commit to prevent corruption, in any form, by its officials by following transparent procedures.

In order to achieve these goals, the Principal, by way of this Integrity Pact ("the Pact") will appoint Independent External Monitor ("IEM") who will monitor the tender process and the execution of the Contract for compliance with the principles mentioned above.

The parties hereto hereby agree to enter into this Pact and agree as mentioned below.

Section 1
Commitments of the Principal

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following:-
   a. No employee of the Principal, personally or through relatives or any other person, will in connection with the tender, or for the execution of the Contract, demand, promise or accept for himself/herself or any third person, any material or immaterial benefit or any other advantage from the bidder/s or contractor/s which he/she is not legally entitled to.
   b. The Principal will, during the tender process treat all Bidder/s and Contractor/s with equity and reason. The Principal will in particular, before and during the tender process, provide to all bidder/s and contractor/s the same information and will not provide to any bidder/s or contractor/s additional/confidential information through which the bidder/s and contractor/s could obtain an advantage in relation to the tender process or the contract execution.
   c. The Principal will exclude from the process all known prejudiced persons.

2. If the Principal obtains information on the conduct of any of its employees, which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion and the same is prima facie found to be correct in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions In such a case while such enquiry is being conducted by the Principal, the proceedings under the contract shall not be stalled.

Section 2
Commitments of the Bidder/ contractor

1. The Bidder / Contractor commits to take all measures necessary to prevent corrupt practices, unfair means and illegal activities. He commits himself to observe the following during his participation in the tender process and during the contract execution:
   a. The Bidder / Contractor undertakes that he/she has not given, offered or promised to give directly or indirectly any bribe, gift, consideration, reward, favour any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Principal, for which benefit etc. he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
   b. The Bidder / Contractor will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees,

brokerage or inducement to any official of the Principal, for which benefit etc. he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract

c. The Bidder / Contractor will not enter into any agreement or understanding with other Bidders in connection with the bid, including but not limited to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.
d. The Bidder / Contractor will not commit any offence under the relevant provisions of Anti-Corruption Laws of India/Indian Penal Code, 1860, Information and Technology Act, 2000, Competition law or any other relevant laws, enactments, rules and regulations. Further the Bidder / Contractor will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically. The Bidder / Contractor also undertakes to exercise due and adequate care of any such information so divulged.
e. The Bidder / Contractor further confirms and declares to the Principal that the Bidder / Contractor is the original manufacturer / integrator / authorised government sponsored export entity and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the Principal or any of its functionaries, whether officially or unofficially to the award of the contract to the Bidder / Contractor, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
f. The Bidder / Contractor will, when presenting his bid, disclose any and all payments he has made, is committed to make or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and the details of the services agreed upon for such payments.
g. The bidder(s)/ contractor (s) of foreign origin shall disclose the name and address of agents and representatives in India related to this tender. Similarly, the bidder(s)/ contractor(s) of Indian nationality shall furnish the name and address of their foreign principals or associates, if any, related to this tender.
h. The Bidder / Contractor shall not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
i. If the Bidder / Contractor or any employee of the Bidder / Contractor or any person acting on behalf of the Bidder / Contractor, either directly or indirectly, is a relative of any of the officers of the Principal, or alternatively, if any relative of an officer of the Principal has financial interest / stake in the Bidder's / Contractor's firm, proprietorship, company, etc. the same shall be disclosed by the Bidder / Contractor at the time of filing of tender/EoI. The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act, 2013.
j. The Bidder / Contractor shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the Principal.

k. The bidder / contractor shall disclose the circumstances, arrangements, undertakings or relationships that constitute, or may reasonably be considered to constitute, an actual or potential conflict of interest with its obligations specified in the tender process or under any Agreement which may be negotiated or executed with Principal. Bidder / Contractor and its employees, agents, advisors and any other person associated with the bidder / contractor must not place themselves in a position which may, or does, give rise to conflict of interest (or a potential conflict of interest between the interests of Principal or any other interests during this tender process or through operation of the Agreement.

l. The bidder(s)/ contractor (s) who have signed the Pact shall not approach the Courts while the matters/disputes/issues, related to tender process or the Contract are presented before the IEM and awaiting the final decision.

2. The Bidder / Contractor will not instigate third persons to commit above mentioned acts / omissions / offences outlined above or be an accessory to such offences.

Section 3

Disqualification from tender process and exclusion from future contracts

1. If the Bidder, before the Contract is awarded, has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or credibility as Bidder into question:
   a. the Principal is entitled to disqualify the Bidder from the tender process or to terminate the Contract, if already signed, for such reason.
   b. the Principal is entitled to exclude the Bidder / Contractor from participating in future contracts/tenders. The imposition and duration of the exclusion will be determined by the Principal based on the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder / Contractor and the amount of the damage. The exclusion will be imposed for a minimum of six (6) months and maximum of three (3) years.
2. An act/omission would be treated as a transgression after due consideration of the available evidence by the Principal.
3. The Bidder / Contractor accepts and undertakes to respect and uphold the Principal's absolute right to resort to and impose such disqualification/exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision of disqualification/exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.
4. If the Bidder / Contractor can prove that he has restored the damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the aforesaid disqualification/exclusion prematurely.

Section 4
Compensation for Damages

1. Without prejudice to any rights that may be available to the Principal under any law or the contract or its laid down policies and procedures, the Principal shall have the following rights in case of breach of this Pact by the Bidder/Contractor:
   a. To forfeit the Earnest Money/Bid Security if the Bidder is disqualified from the tender process prior to the award in terms of Section 3;
   b. To forfeit/invoke the Security Deposit/ Performance Bank Guarantee if the Principal has either terminated or is entitled to terminate the Contract of the Bidder in terms of Section 3.
   c. To immediately call of the pre contract negotiations without assigning any reason or giving any compensation to the Bidder / Contractor.
   d. To immediately cancel the contract, if already signed, without giving any compensation to the bidder / contractor. The Bidder / Contractor shall be liable to pay the compensation for any loss or damage to the Principal resulting from such cancellation / rescission and the Principal shall be entitled to deduct the amount so payable from the amount due to the Bidder / Contractor.
   e. To recover all sums already paid by the Principal, with interest at __% @ p.a. if any outstanding payment is due to the Bidder / Contractor from the Principal in connection with any other contract, such outstanding payment could also be set off to recover the aforesaid sum and interest.
   f. To recover all sums paid in violation of this Pact by the Bidder / Contractor to any middleman or agent or broker with a view to securing the contract.

Section 5
Previous transgression

1. The Bidder declares that he has not committed any transgressions in the last three (3) years against any Company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could invite/justify his exclusion from this tender process.

2. Any concealment of information or misrepresentation of facts, in regard to the aforesaid, can lead to his disqualification from the tender process or termination of the Contract, if already awarded, or invite any other appropriate action(s) as deemed fit.

Section 6
Equal treatment of all Bidders / Contractors / Subcontractors

1. The Principal will enter into Pacts on identical terms with all bidders and contractors.
2. The Bidder(s) / Contractor(s) assures to procure from all their subcontractors an undertaking for the adoption of this Pact. The Bidder (s) / Contractor(s) shall alone be

responsible for any violation (s) of the provisions laid down in the Pact by any/all of their sub-contractor (s) or sub-vendor (s).

3. The Principal will be entitled to disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 8
Independent External Monitor / Monitors

1. The Principal appoints competent and credible Independent External Monitor as nominated and approved by the Central Vigilance Commission. The task of the IEM is to review independently and objectively, whether and to what extent the Parties comply with the obligations under this Pact. The IEM would be required to sign 'Non- Disclosure Agreements' alongwith a declaration of 'Absence of Conflict of Interest'. In case of any conflict of interest arises at a later date, the IEM shall inform Chairperson of the Board of the Principal and recuse himself/herself from that case.
2. The IEM is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal. The IEM would be provided access to all documents/records pertaining to the contract for which a complaint or issue is raised before them, as and when warranted. However, the documents/records/ information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
3. The Bidder / Contractor accepts that the IEM has the right to access, without restriction, all Project documentation available with the Principal including the documents/ records/ information provided by the Bidder/Contractor. The Bidder/Contractor will also grant the IEM, upon their request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The IEM is under contractual obligation to treat the documents/ records/ information of the Bidder/Contractor/ Subcontractor with confidentiality.
4. The Principal will provide to the IEM sufficient information about all meetings among the parties related to the Project provided that such meetings could have an impact on the contractual relations between the Principal and the Bidder/Contractor. The Parties will offer to the IEM the option to participate in such meetings.
5. As soon as the IEM notices, or suspects, a violation of this Pact, he will inform the Management of the Principal and request the Management to discontinue or rectify the violation, or take any other relevant action. The IEM can in this regard submit nonbinding recommendations. Beyond this, the IEM has no right to demand from the Parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to the Bidder / Contractor to present his case before making its recommendations to the Principal.
6. The IEM is expected to tender their recommendation on all the complaints within 30 days of their receipt, to the Chairperson of the Board of the Principal. Further, should the occasion arise, the IEM may submit proposals for correcting problematic situations.

7. If the IEM has reported to the Chairperson of the Board of the Principal a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India/Indian Penal Code, 1860, or any other relevant laws and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEM may transmit this information directly to the Central Vigilance Commissioner, Government of India.
8. The word 'IEM' would include both singular and plural.

Section 9
Pact Duration

1. This Pact comes into force when both parties have signed it. It expires for the Bidder / Contractor 12 months after the last payment under the respective contract, and for all other Bidders / Contractors 6 months after the contract has been awarded.

2. If any claim is made / lodged during the aforesaid duration, the same shall continue to be valid despite the lapse of this pact as specified above, till it is discharged / determined by Chairperson of the Board of the Principal.

Section 10
Other provisions

1. This Pact is subject to Indian Laws. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Pune. The Arbitration clause provided in the main tender document / contract shall be applicable to any issue / dispute arising under this Pact.
2. If the Contractor is a partnership or a consortium, this Pact must be signed by all partners or consortium members.
3. In case of any allegation of violation of any provisions of this Pact or payment of commission etc. the Principal or its agencies shall be entitled to examine all the documents including the Books of Accounts of the Bidder / Contractor and Bidder / Contractor shall provide necessary information and documents and shall extend all possible help for the purpose of such examination.
4. If one or several provisions of this Pact are held to be invalid/unenforceable, the remainder of this Pact shall remain valid as though the invalid or unenforceable parts had not been included herein. In this case, the parties will strive to come to an agreement to their original intentions.
5. Issues like warranty/ guarantee etc. shall be outside the purview of IEM.

---------- ----------

For the Principal For the Bidder / Contractor

Place ----------

Witness 1 : ----------

Date ----------

Witness 2

ANNEXURE G – TEMPLATE FOR CONFORMITY TO SCHEDULE OF REQUIREMENTS

Superconducting QPU

Sl.no	Metric	Whether provided in the Bid		Remarks
		Yes	No	
1	Superconducting Quantum Processing Unit (QPU) in the range of 50 to 100 qubits			
2	Median T1 time ≥ 40 micro secs			
3	Median T2 time: ≥ 20 micro secs			
4	Median Single-Qubit Gate Fidelity: ≥ 99.7%			
5	Median Two-Qubit Gate Fidelity: ≥ 99%			
6	Single-Qubit Gate Duration: ≤ 50 ns			
7	Two-Qubit Gate Duration: ≤ 100 ns			
8	Median Readout Fidelity: ≥ 97%			
9	QPU Package, Enclosure, and Wiring: Fully integrable with cryogenic and control systems. Magnetic shielding as needed			
10	Demonstration of a representative application utilizing all the delivered qubits in the QPU			
11	Amplifiers: Cryogenic electronics to support QPU performance including travelling wave parametric amplifiers (TWPA), HEMT amplifiers, isolators, circulators, attenuators etc. These shall be provided for supporting 250 qubits or more			

Dilution Refrigerator

Sl.no	Metric	Whether provided in the Bid		Remarks
		Yes	No	
1	Dilution refrigerator			
2	Full capacity DC wiring for supporting the qubits offered and further scalable to 250 qubits.			
3	Guaranteed Base Temperature <10 mK			
4	Cooling power at 100 mK >400 uW			
5	Plate Diameter >= 500 mm			
6	No. of Co-ax lines > 1000			
8	Gas Handling System			
9	Passive vibration dampening			
10	Liquid nitrogen trap, Oil-free, Cryogenic magnetic shield, Vacuum and magnetic shield, Warm up heaters			
11	System shall include vacuum turbo pump, water chiller, He leakage detector, compressed air supply unit			
12	Oil-Free Pumps for System Operation			
13	Long-Life Cold Trap (≥ 1 year continuous operation)			
14	Integrated Nitrogen Heat Pipes for Fast Cool Down			
15	Automatic Recovery from Power Failure without Control Computer			

Cryogenic System and Temperature Control

Sl.no	Metric	Whether provided in the Bid		Remarks
		Yes	No	
1	Standalone Control Unit			
2	Temperature Controller			

Control Electronics

Sl.no	Metric	Whether provided in the Bid		Remarks
		Yes	No	
1	Control electronics			
2	The control electronics solution for supporting the qubits offered and further scalable to 250 qubits.			
3	Compact control electronics portable rack mountable chassis to deliver QPU performance as mentioned in 1.1 of SECTION – IV.			
4	Plug and play module for readout, control lines and flux lines for provided QPU.			
5	Frequency range: 0-10 GHz readout, control lines and flux lines for provided QPU.			
6	Mixer calibration free operation			
7	Flux lines output: ~ +/- 2 Vpp in a 50 ohm load.			
8	Integrated DC coupling as needed			
9	Control lines with an output upto 10 dBm, SFDR <- 40 dBc, phase noise <-110 dBc/Hz			
10	Readout lines with input power <-20 dBm and on card measurement result storage memory			
11	Relative Phase stability across multiple RF (3-8 GHz) output modules over 1 hr <2 deg			
12	Low latency feedback <400-600 ns			
13	Synchronization jitter of the order of ps across multiple modules.			
14	TWPA pump lines compact electronics possibly integrable in the compact electronics rack			

15	Pulse sequence programming framework allowing for gate implementation with real-time phase, frequency and amplitude adjustment and complete control over the implementation flow			
16	Control electronics software UI and editor for easy management and configuration of the control electronics			
17	Open QASM complaint API and pulse level API access the control electronics solution			
18	Direct FPGA access provision to implement decoding algorithms towards error correction			
19	Input Voltage and Frequency: Complying with Indian A/C Power specifications			
20	Ambient operating temperature: 15 degrees to 40 degrees Celsius			
21	Ambient operating temperature: 15 degrees to 40 degrees Celsius			
22	Control electronics calibration cycle ~ 2 years			

IT Hardware and Software

Sl.no	**Metric**	**Whether provided in the Bid**		**Remarks**
		Yes	**No**	
1	IT hardware & Software			
2	High-Performance Host Server for managing quantum operations.			
3	Full-Stack Quantum Software			
4	Automation Software for Qubit characterization, tuning, optimization, scaling and error correction			
5	System Integration and			

	Management Tools			
6	Networking and Power systems			
7	Quantum Access Node			
8	Power Systems			
9	IoT Infrastructure and Telemetry			
10	Physical and Cybersecurity			
11	Access Control Systems			
12	Surveillance Systems (CCTV, Motion Detectors)			
13	Fire Suppression System			

Application benchmarks

Sl.no	Metric	Whether provided in the Bid		Remarks
		Yes	No	
1	Demonstration of Quantum Volume of n or higher, utilizing all the delivered qubits (n) in the QPU			
2	Demonstration of the Randomized Benchmarking test suite			
3	Hybrid Classical – QC : Demonstration of QAOA application, utilizing all the delivered qubits in the QPU			

Documentation & Training

Sl.no	Metric	Whether provided in the Bid		Remarks
		Yes	No	
1	Comprehensive Instruction Manuals and Datasheets for all hardware and software components.			
2	Design and architecture document of the QPU being offered			
3	Quantum Control Hardware – Detailed specification & operating ranges for different subcomponents			
4	Training covering system operation and maintenance			

	(for atleast 80 hrs.)			
5	Training on planar design and fabrication of QPUs (for atleast 100hrs.)			
6	Yearly Refresh Training for continued proficiency.			

Support, Maintenance and Acceptance

Sl.no	Metric	Whether provided in the Bid		Remarks
		Yes	No	
1	Comprehensive Onsite Support & Maintenance covering all hardware, software and integrated system for 3 years (post acceptance)			
2	Warranty of the goods supplied and integrated system for 3 years (Extendable to additional 2 years)			
3	Provision of 2 sets of maintenance tools and spare parts for routine upkeep and emergency repairs.			
4	The supplier shall provide a detailed SLA outlining response times, uptime guarantees, and penalties for non-compliance in the technical proposal submitted			

Annexure H

CERTIFICATE FROM BIDDER

o:

Executive Director,
Centre for Development of Advance Computing,
C-DAC Knowledge Park, No.1, Old Madras Road,
Byappanahalli, Bangalore-560038
Phone Nos.080-25093400

Ref: Tender No: ……

We hereby certify that the goods being offered by us vide our proposal, comply with the provisions of order No. Order No P-45021/2/2017-PP (BE-II), dated 4th June, 2020(as amended), issued by Public Procurement Division, Department for Industry and Internal Trade, Ministry of Commerce & Industry, GoI, read with order number W-43/4/2019-IPHW- MeitY, dated 7th September, 2020 issued by IPWH division of MeitY, GoI.

We hereby certify the details pertaining to goods offered by us, as given below:

Sr. No	Item Description	Make & Model No.	Country of origin of OEM	Country of Manufacture of item	Country of Shipment	Percentage of local contents as defined by order number W-43/4/ 2019-IPHW- MeitY, dated 7th Sept, 2020 issued by IPWH division of MeitY, GoI
1	Supply, Installation, Testing & Commissioning of Project Management software licenses for 100 users with Interactive project management dashboard					

We also certify that, we are not from a country sharing land border with India as defined in order No. F/No/6/18/2019-PPD dated 23 July 2020 issued by public procurement Division, Dept. of Expenditure, Ministry of Finance, GoI and the goods offered by us comply with the provisions of said order.

For (Name of bidder)

Authorized Signatory
Name & Designation:
Mobile No:

Annexure I

On your letterhead
Self-Certification under preference to Make in India order

CERTIFICATE

In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017 &P45021/2/2017-PP (BE-II) dated 28.05.2018, we hereby certify that we M/s ……..…… are local supplier meeting the requirement of minimum local content (…%) as defined in above orders for the material against GeM Bid No. …… dated …….. Details of location at which local value addition will be made is as follows: Address…….

We also understand, false declarations will be in breach of the Code of Integrity under Rule175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for upto two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as maybe permissible under law. Seal and Signature of Supplier

Thanking You

for M/s …….

(Authorized Signatory)

ANNEXURE J – DOCUMENTS CHECK-LIST

Sl. No	Document	Page Numbers	Yes/No
	e-Packet – A		
1	Covering Letter**(Annexure-A)**		
2	Authority Letter **(Annexure-B)**		
3	Transaction details towards online payment of EMD		
4	Documents check list **(Annexure H)**		
5	A self-attested copy of Partnership deed / Memorandum and Articles of Association as applicable.		
6	Self-attested copies of GST registration certificate, as applicable.		
7	A self-attested copy of PAN card, if applicable		
8	Self-certified copy of Balance Sheets/ Certificate from CA towards certification of turnover for last three years.		
9	Undertaking(s) from OEMs/Principal Manufacturers of the various components **(Annexure- C)**		
10	Bid Acceptance Letter **(Annexure – E)**		
11	Integrity Pact **(Annexure – F)**		
12	Copies of purchase orders and installation reports, as per eligibility criteria and any other documents in support of eligibility criteria		
14	Technical Bid, Documents Brochures, Catalogs, data sheets, tables etc. on the solution offered.		
16	Duly filled compliance statements and BoM Tables		
17	Benchmark Results and Tables		
18	Copy of Un-priced commercial bid along with commercial terms and conditions		
19	Conformity to Schedule of Requirements **(Annexure – G)**		

	e-Packet – B		
20	Commercial bid along with commercial terms and conditions		

(END OF DOCUMENT)